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CXN network player



AUDIOLAB 8300A
amplifier



EXCLUSIVE!
CLEARAUDIO ABSOLUTE PHONO
phonostage

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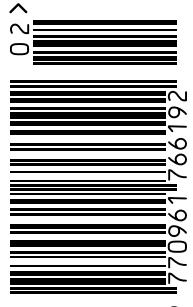
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Cayin N6

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Rafael Todes, Mark Osborn

It's obvious from our mail that there's a resurgent interest in vinyl. Kick yourself now if you threw your LPs away back in the mid 1980s, convinced by the overarching view of the time that digital was perfect and all else "gaslight", as a famous conductor put it. Hah!

But I don't blame you. When I politely tried to explain to one BBC engineer that CD actually produced more than 100% distortion he shouted at me that I didn't understand! In truth I'd just bought a brand new Hewlett Packard spectrum analyser that was the doggies, and it clearly flagged

up figures I barely believed. All the same, the pressure was on and the sheep in full stampede, shiny CDs in hand, mimicking an episode of *Shaun the Sheep*, if a little less funny.

Happily, those dark digital days are over and you can now move onto the bright sunlit uplands of high-resolution digital that doesn't shred ears with lacerative distortion. In this issue, commencing p11, we look even more closely at successors to the successor, reviewing three portable digital audio players that potentially move sound quality ahead of that possible from CD.

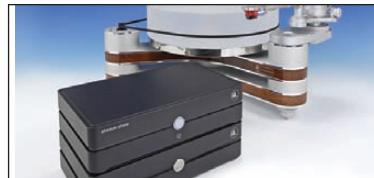
The three new models effectively illustrate the variation that exists between current brands and models: this is a new and fast moving market technologically. I hope you find it interesting – and the products affordable. Far East manufacture and the lack of CD's monopoly means you can great sound at great prices.

All of which brings me to resurgent interest in gaslight. Yes, right back at the other end of the historical spectrum, in earlier times when we padded through dark streets of technological ignorance (cough) pierced only by gaslight, boxes of cogs and wheels provided entertainment. How ironic that these contraptions should slowly re-emerge to entertain us in our living rooms once again, displacing the inert boxes invented to provide digital. I'll admit the construction that I am bemused by, from Clearaudio of Germany on p95, isn't going to be within the budget of many, especially me, but it sure as hell looks fabulous. As a counterbalance to this we also feature two super-low price moving coil cartridges from Japan, that Paul Rigby peers at on p103.

Please don't kick yourself too hard if all the LPs of your youth got skipped, 'cos new pressings are tumbling onto the market. Abbey Road studios tell us the world's remaining pressing plants are overwhelmed with demand. Hi-fi is forever an interesting place to be, I hope you enjoy reading about it in this issue.

Noel Keywood

Editor



hi-fi world

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verdicts



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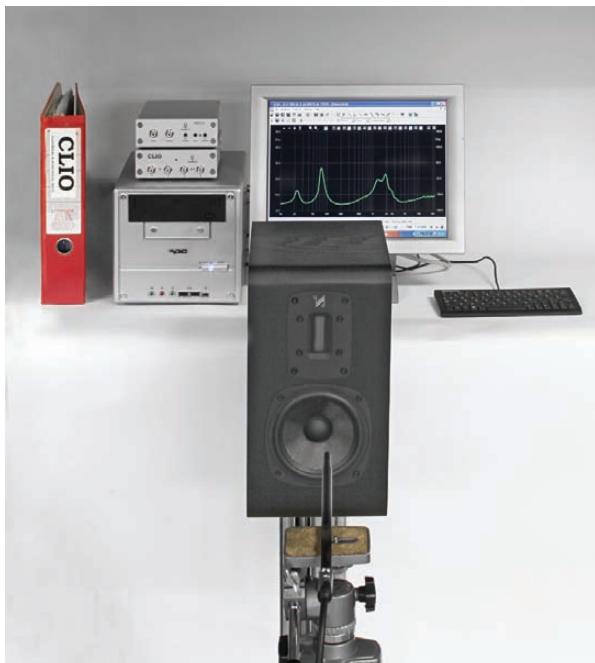
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Steve Hackett, Spectral Mornings.

Hi-Fi World measurement

Two products in this month's issue, under test.

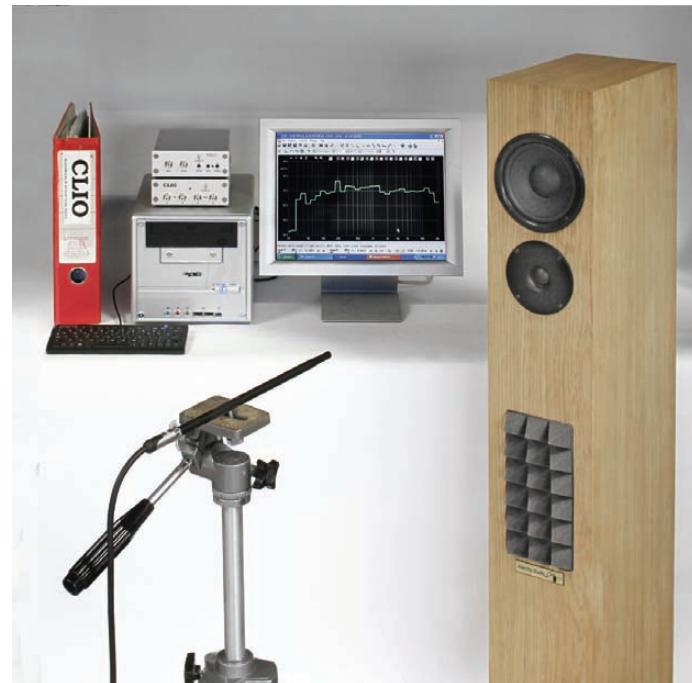
The products we review are tested first to ensure they work properly and meet their manufacturer's specification. Our measurements also look at factors that affect sound quality, like frequency response, distortion and dynamic range, as well as those that affect compatibility, such as output level, output power etc. Many of these tests are complex and can only be made using an advanced audio analyser, calibrated to international ISO standards to ensure accuracy. Hi-Fi World uses the well known Clio test system from Audiomatica, Italy – used widely in industry – to provide reference standard acoustic measurements, within a very large 6000 cu ft test room. You can be sure our loudspeaker reviews accurately show how a loudspeaker will behave in your room.



The Quad S2 loudspeaker under test. We measure frequency response using pink noise and third octave analysis, as well as gated sine wave pulses.

On the analyser screen here, however, is a plot of the S2's impedance.

Wide frequency range measurements, reaching down to 20Hz, show both that the S2 has been contoured well for near-wall use, and that the ribbon tweeter provides plenty of high treble.



The Alacrity Dundee 5 floorstanding loudspeaker under test. In front you can see a measuring microphone and on-screen is the block outline of a third-octave analysis of a pink noise test signal. This has an energy distribution much like that of music, reaching down to 20Hz to give a useful view of Dundee's unusual but well proportioned bass response.

email:news@hi-fiworld.co.uk

news

BEATLES 1: An Exclusive listen

The Beatles best-selling 1 album has undergone a transformation with a new 2LP, 180g vinyl edition in a gatefold sleeve. Most importantly the new edition features new stereo remixes from the original master tapes by Giles Martin and Sam Okell with half-speed mastering at the hands of Abbey Road Studios renowned engineer Miles Showell.

Hi-Fi World was treated to an exclusive preview ahead of the album's release

– with the new cut played back via a Vertere Acoustics RG-1 turntable with Reference tonearm, Miyajima Madake MC cartridge, FM 122 MkII phono amp, FM 245 pre-amp and active PMC MB2/XBD loudspeakers.

The new mastering has made a significant difference – with greater definition, instrumental separation and more punch and presence.

The new edition features 27 Beatles No 1 songs – from Love Me do to Let It Be – as well as an exclusive poster and artwork cards, and costs £35.

For more information log-on to www.thebeatlesonline.co.uk.

Also look out for an exclusive interview with Abbey Road's Miles Showell on half-speed mastering in a forthcoming Hi-Fi World.



Guy Haden (left) Vice President of Apple Corps with Abbey Road's mastering guru Miles Showell.



MERIDIAN UPGRADED 808V6

Meridian has introduced the latest generation of its 808 CD player, part of the 800 Reference Series. The 808v6 now decodes Master Quality Authenticated (MQA) sources. At the heart of the system, the 808v6 offers CD playback from an internal CD-ROM based drive for, says the company, improved data recovery and error correction.

Other enhancements include upgraded S/PDIF and USB receivers that enables USB and RCA inputs to receive up to 192kHz digital audio; an enhanced DSP chip that offers lip-sync control, DSD playback (DoP) and MQA rendering capability for analogue outputs. The analogue outputs also feature bass, treble and balance controls and an improved analogue output card that features an upgraded circuit with filtering.

Further details include full controller/preamp functionality with Meridian technology including ROM drive, triple FIFO buffering and DSP apodising upsampling filter. There's also direct connection to a Meridian Sooloos System.

Available in Black and the complete range of 270 Meridian Select colours, price is £11,000. Log-on to www.meridian-audio.com or call 01480 445678 for more information.

NAIM FIRMWARE

Naim has released firmware updates to both the Naim DAC (colloquially known as the nDAC) and the DAC-VI.

The firmware updates add single and double rate DSD to both DACs. This has required some significant additional programming and optimisation of the core DSP code.

The Naim DAC accepts DSD input over S/PDIF or on a USB stick (dsf or dff files) plugged into its front or rear USB inputs. The DAC-VI's USB input is asynchronous, allowing the connection of a PC or Mac directly, or using S/PDIF. Sample Rate Conversion (SRC) has also been added to the DAC-VI. This allows the user to configure a digital input to adjust on-the-fly to input clock signals that are out of range. This improves overall robustness with S/PDIF sources that do not have an accurate clock.

Mac users need no extra drivers but Windows, including Win 10, users will need the new version 2.00.0 driver downloadable from the Naim website.

Visit www.naimaudio.com or call 01722 426 600 for more help.





MCINTOSH C1100 PRE

McIntosh has launched a two-chassis preamplifier, allowing the control and power sections to remain completely separate from the audio section. The C1100 comprises the C1100 controller and the C1100 vacuum tube preamplifier. Inside each chassis, the left and right channels are electrically and mechanically isolated from each other to allow true dual-mono operation.

The two boxes are connected together via a pair of specially designed shielded umbilical cables. All power control, data ports and external control connections are dual-microprocessor – managed and located in the C1100's controller chassis. The unit can be operated either directly on the C1100 controller's front panel or using the remote control. The C1100 sells for £12,995.

For more information call 01202 911886 or go to www.mcintoshlabs.com

ARCAM MUSICLIFE APP

The latest version of Arcam's MusicLife app adds control for all modern Arcam components, including the forthcoming Solo Music/Movie and AVR550/850 Atmos AV Receivers.

In addition to standard UPnP functions, the app plays media from servers to any Bluetooth device, enabling streaming to almost anything paired with an Arcam miniBlink or rBlink Bluetooth DAC.

You can control the Media Player in Arcam network-based music systems. playback.



XQISIT

...has announced its new XQ S20, compact, portable Bluetooth speaker available directly from Carphone Warehouse.

Featuring a Li-ion battery, offering up 20 hours of playback time, the XQ S20 can be recharged via USB – reaching a full charge in less than five hours.

Sonically, it offers 6W of stereo sound plus a passive subwoofer. An in-built microphone allows users to carry out hands-free conversations too.

Available in black, silver and gold, the chassis includes a 3.5mm line-in for non-Bluetooth enabled devices. Price is £90.

For more information go to www.carphonewarehouse.com.



ANSUZ ACOUSTICS

The Darkz d tc resonance control is the company's first product release that sits within its high-end, d tc, line.

Made of a heavy composite material that was created in, of all things, a particle accelerator to create a hard and dense material structure, containing diamond, the Darkz d tc weighs in at a meaty 216gm each.

The line arrives featuring two models: the Darkz d tc Resonance Control and Darkz d tc Cable Lifters. The Darkz d tc Resonance Control is designed to stand under hi-fi equipment while the Darkz d tc Cable Lifters are to be placed, you guessed it, under cables. Prices range from £359 each for the Resonance Control and from £460 per cable lifter.

For more information, call +45 40 51 14 31 or go to www.ansuz-acoustics.com



HECO DIRECT

Attempting to recall the design and styling from the fifties and sixties, Heco has revisited the wide baffle, 2-way loudspeaker format with a 27cm midbass driver with Kraft paper diaphragm and alloy chassis and a 28mm silk dome tweeter with double magnet and horn loading. The wide baffle design provides radiused edges to, says the company, offer a lower baffle step frequency and fewer harmful diffraction effects. Meanwhile, the cabinet produces space for twin down-firing bass reflex ports with rounded ends for minimal turbulence. The speaker runs at 95dB sensitivity.



Arriving in white, black and silver, the price is £2,500. For further details call 01822 612449 or go to www.puresound.info.

HEADROOM

The UK's largest and most prestigious headphone show takes place in London on January 29-30. More than 40 manufacturers will be demonstrating their wares at Headroom – including Chord Electronics with their new Mojo headphone DAC/amplifier along with Shure, B&W, Astell&Kern and KEF.

One of the highlights will also be the debut of Sennheiser's new – and eagerly anticipated – HD800s while the Chord Company will also be demonstrating their range of digital interconnects. Other exhibitors include Shure, Stax, Oppo, Resonessence and Audeze while there will be various listening sessions and demonstrations throughout both days.

The event is being held at Metropolis Studios in Chiswick – host to a diverse range of artists including Adele, U2, The Stone Roses and Queen – and tickets are available now at www.head-room.co.uk priced £10 for each day.



GENELEC 1236 SMART ACTIVE MONITORING

Generic has unveiled its new flagship 1236 Smart Active Monitoring (SAM) Main Monitor System accompanied by the individually calibrated 3U-high Remote Amplifier Module RAM-XL.

The new design is based on the high-efficiency proprietary double-18-inch bass driver design of Genelec's 1036.

The 1236's frequency response extends from 17Hz to 26kHz and it is capable of delivering 130dB SPL through a combination of modern digital signal processing and Class D amplifiers, providing 1000W, 800W, and 400W of short-term power into woofer, midrange and tweeter channels, respectively. The 960 x 1180 x 650mm enclosure features two 457mm high-linearity woofers, two Genelec proprietary 127mm midrange drivers, as well as a 51mm high-compression tweeter mounted in a very large Directivity Control Waveguide (DCW) enclosure.

Weighing in at 182kg, connections include a XLR analogue input, two XLR AES/EBU inputs/outputs and two RJ45 control network sockets. Price is TBA. For more information visit www.genelec.com



WHARFEDALE DX

The DX-1 SE 5.1 speaker system from Wharfedale consists of four satellite speakers for the front and rear plus a similarly diminutive centre speaker and a compact active subwoofer. The speakers take their design cues from the Diamond standmount speakers, albeit shrunk to a much smaller size – the satellites are just 19cm high.

Each DX-1 SE Satellite sports a 19mm silk dome tweeter and 75mm mid/bass driver with a woven polypropylene cone. The enclosure is an infinite baffle design which aids the speakers' ability to be sited in close proximity to a wall. The DX-1 Centre incorporates the same silk dome tweeter flanked by two 75mm mid/bass drivers. Its design includes an aperiodic loading system consisting of a vent that is filled with resistive porous foam to control airflow. The matching WH-D8 active subwoofer combines a 200mm long-throw bass cone with a 120W amplifier.

The package is available for £400. Call 01480 447700 or go to www.wharfedale.co.uk.

AK320

Astell & Kern has launched the AK320, its new high-resolution portable music player that features trickle-down styling and features from the flagship AK380. Created from a single block of aluminium the AK320 includes a VCXO Clock to reduce jitter, a 24bit/192kHz Dual-DAC design, multiple file format support, including DSD, balanced and standard 3.5mm outputs, 128GB of internal memory and a microSD.

Wi-Fi connectivity and an AK Connect App enables network streaming and Bluetooth support that wirelessly streams to headphones or speakers. You also get a 102mm touch screen and the option to connect to a USB DAC.

Spanning 75 x 4.4 x 16.4mm and weighing 217g, the AK320 is priced at £1,499. For more information log-on to www.unlimited.com.



PRO-JECT MAIA DS

Pro-Ject has announced the MaiA DS for its DS range of high-quality electronics. It acts as a pre-amplifier, integrated amplifier, a DAC, headphone amp and a phono stage – all in one box.

It provides three analogue inputs, three digital inputs, a phono stage, USB and Bluetooth streaming. The 60W per-channel amp module has a Class D output stage while the digital portion has a PCM1796 Delta-Sigma DAC chip with 24bit/192kHz high-resolution audio handling. In addition, the USB input uses XMOS asynchronous streaming technology and it can also handle up to DSD256 playback (DoP). The 4th generation Bluetooth input is aptX enabled while the switchable MM/MC phono stage is based on Pro-Ject's Phono Box technology.

Price is £699. To learn more go to www.henleydesigns.co.uk or call 01235 511166





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It got better by change.
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bowers-wilkins.com

Pocket power

Today's high-resolution portable digital audio players pack astonishing performance into a small package and can replace a CD player. But with so many to choose from, how do you pick the best one for your needs? In a special eight-page feature Noel Keywood and Jon Myles test out three of the latest models and guide you through the various options available.

Not so long ago buying a small digital music player meant plumping for an Apple iPod or similar – with all the attendant sonic restrictions of less than ideal headphone output chips and restricted DACs. All that has changed over the past couple of years: high-resolution digital audio players of massive ability are now available from £100 upward.

All promise better sound quality than a CD player. But they are not, we find, created equal...read on to discover more.



Cayin Cool!

Distinctive looks and a dynamic sound make the Cayin N6 one of the best portable high-resolution digital players at its price, says Jon Myles.

Portable digital audio players (DAPs) come in many shapes and sizes these days but Cayin have still managed to make their new N6 one of the most unusual looking you'll come across - as well as one of the largest.

Constructed from a CNC-machined block of aluminium with a carbon fibre back panel, the main

body measures a hefty 126mm x 68mm x 17.6mm (H/W/D). Added to that is a large, round display window at the top whose surround protrudes slightly both above and to the sides of the main body. With a weight of 230g (the Lotoo PAW 5000 reviewed in this issue weighs 110g) it's a substantial product.

The looks will probably divide opinion in the usual 'love it or hate it' manner. Personally, I think it's a welcome change from the norm.

Beneath the main window are four buttons arranged in a fashion that looks vaguely like an Art Deco motif. They control a variety of commands depending what menu you are in - but essentially handle enter, play, back, pause and up/down menu functions.

There's also a jog-dial wheel on the left-hand side of the unit which replicates most of the button functions while an up/down volume control sits on the right.

In use the controls take a little getting used to (you press the up button to get back to the beginning of a track, for example) but after a solid day's use they became fairly intuitive.

Connections consist of both line and digital coaxial outs, the 3.5mm headphone socket and micro USB for charging and connection to a computer. There's 8GB of internal memory plus an SD card slot for adding more storage. The usual array of file formats are catered for up to 24bit/192kHz resolution as well as DSD 64 and 128.

Other features include the choice of Sharp or Slow digital filters, two gain settings and EQ with eight pre-sets (Rock, Classical, Jazz,

Pop etc) as well as the ability to be tailored to your individual taste.

Also included in the box are a microSD to USB card reader (handy), protective rubber sleeve (very handy) and a branded keyring (slightly pointless). Taken together it's a classy-looking package and the N6 itself has the build and looks to justify its £439 price tag. But, as ever, it's the sound that counts...

SOUND QUALITY

It doesn't just look unusual, the N6 also differs from most of its price rivals by employing a dual DAC arrangement - one TI PCM1792A chip for each channel. Cayin says this improves dynamic range and lowers distortion (see Measured Performance for full details). And straight from the off you can hear they have a point.

Loaded with the latest version 3.1 firmware update and plugged into a pair of Noble K10 custom in-ear monitors the Cayin immediately impressed me with a dynamic and detailed sound.

Playing 'Barbarians' from The Libertines' 'Anthems For Doomed Youth' the drum crack before the start of the first chorus was like a gunshot going off in my ears - just as it should be. Throughout there was superb separation between the guitars, drums and bass while Pete Doherty's vocals were noticeably easier to follow than on some other players, that bury them too deep into the mix.

Part of this was down to the fact that bass was tight and well-defined, without artificial over-emphasis. This makes the N6 sound exceptionally punchy and allows room for the midband to breath. Treble was also clean and extended, without harshness or sting to it. On





UNISON RESEARCH



The finest sound money can buy

Unison Research's high-end valve-only electronics can be found on demonstration at the following premium hi-fi specialists. **Find out more at www.unisonresearch.co.uk**

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Audio T

Brentwood, Essex: 01277 264730

Audio T

Oxford, Oxfordshire: 01865 765961

Dooleys Hi-Fi

Macclesfield, Cheshire: 01625 264666

Hi-Fi Sound

Stockton-on-Tees: 0845 6019390

Peak Hi-Fi

Sheffield, Yorks: 01226 761832

The Audio Room

Hull, East Yorks: 01482 891375

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Zouch Audio

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Lotoo Winner?

Can Lotoo replicate the success of its award-winning PAW Gold with its budget PAW 5000 portable player? Jon Myles finds out.

Chinese manufacturer Lotoo makes one of the finest portable digital players on the market in the shape of the PAW Gold. It's built like a tank, boasts class-leading dynamic range, the ability to drive just about any headphone you can think of and a gloriously vivid sound.

Noel Keywood likened it to carrying a full-sized hi-fi system around in your pocket and it deservedly won a coveted Hi-Fi

World Award as one of the best products of 2015 (Hi-Fi World January 2016). Its only drawback was a not inconsiderable price tag of £1500.

So we were more than interested when Lotoo announced the introduction of a lower cost model in the shape of the Lotoo PAW 5000 at a much more affordable £299.

Naturally, this has involved some cost savings so the 5000 sheds its bigger brother's aircraft-grade solid duralumin body for a basic metal/plastic affair and loses

the 24K gold controls. It also uses a cheaper DAC set - Texas Instruments TLV320AIC3105 – which is described by the manufacturer as a "low power stereo audio codec with headphone amplifier". This can handle up to 32bit/96kHz files although it will also process DSD 64.

It does, however, retain the PAW Gold's powerful Blackfin 451 DSP which processes the digital signal before it reaches the DAC and also runs the operating system. This means, along with the PAW Gold, the 5000 has just about the quickest start-

up time of any portable digital player around and an extremely fast and responsive interface. It's also equipped with Bluetooth for use with wireless headphones or a hi-fi with the necessary receiver and has a combined line/S/PDIF output socket.

The PAW 5000 is a compact and relatively lightweight unit, measuring 98mm x 55mm x 17.5mm (H/W/D) and weighing in at 110g. The front features a 2-inch OLED screen as well as the main controls, chief of which is a scrolling wheel with a play/pause/enter button in the middle. Other buttons control skip/fast forward/next/previous, access to the various music folders and set-up menu and entry to the built-in EQ settings menu.

The left side of the player contains the up/down volume control as well as a gain switch and a high/low sliding damping selector to help match the Lotoo to different headphone impedances. Charging is via the supplied high-speed USB 3.0 cable with battery life put at 10 hours, a figure I just about achieved over the testing period.

Unusually, as well as the standard 3.5mm headphone socket the Lotoo also features a balanced output. Unfortunately, though, this is on a 2.5mm connector similar to that on Astell&Kern's AK240 so requires a special adapter – few and far between at the moment.

There's no built-in memory but the PAW 5000 will accept micro SD cards up to 2TB capacity (good luck with finding one of those).

SOUND QUALITY

Switching from the Cayin N6 also reviewed in this issue to the Lotoo immediately revealed some of the latter's shortcomings.

There's a softer, lighter presentation that struggled to bring out some of the essential details on



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Combining Line out, S/PDIF, Bluetooth and a balanced headphone connection make the Lotoo stand out from its rivals.

many tracks, I found. Listening to The Libertines' 'Anthems For Doomed Youth', the bass lacked depth and definition, while crisp guitar work became more of a gentle strum.

It's not unpleasant and perfectly listenable but robs the music of much of its dynamism. Even through a pair of Noble K10 in-ear monitors – which are fast-paced and detailed – the Lotoo failed to excite me. Dialling in the user-customisable EQ feature did help a little; with a great deal of fiddling I managed to extract slightly more bass and stronger treble

power on the more dramatic tracks, but it sounds more like the player is simply going through the motions in a rather mechanical fashion.

You can't help but feel that in the rush to bring out a more affordable version of the outstanding PAW Gold Lotoo have cut back the original a little bit too much. As it stands the

PAW 5000 is outclassed by rivals costing much less from the likes of FiiO and others.

CONCLUSION

On the plus side, the Lotoo PAW 5000 is a nice, compact player with a fast and easy-to-use interface. Unfortunately, though, it has a rather average sound and fails to get the best out of high-resolution files.



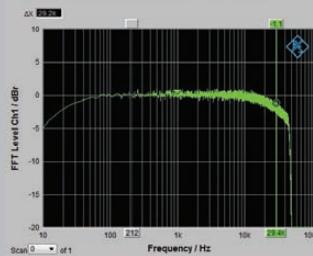
Damping and boost functions allow for matching to different headphones.

MEASURED PERFORMANCE

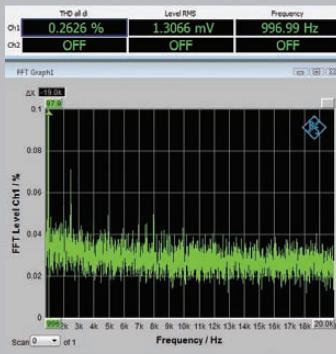
The PAW 5000 produced 1.3V out at its headphone socket when set to HdB (high dB), 227mV set to LdB, and 0.64V from its fixed-volume analogue Line out – below CD's 2V. The headphone socket goes loud, but insensitive Planar Magnetics will need volume set high. The LdB setting is for hearing safety.

Distortion at full level (0dB)

FREQUENCY RESPONSE



DISTORTION



measured 0.007% but at -60dB it measured a poor 0.26% with 24bit digital, where around 0.1% is common from a budget product at -60dB. Noise in the headphone amplifier was the cause, clearly visible in the analysis.

As a result of high noise, EIAJ Dynamic Range (24bit) was low at 99dB from the headphone output – below that of CD at 103dB. So the PAW 5000 delivers worse results than CD from hi-res – unimpressive. Players like FiiO's X3 manage better (115dB) at lower cost.

Frequency response with 192kHz sample rate reached 30kHz (-1dB) and has an upper limit of 48kHz due to the 96kHz sample rate limit (192 being down-sampled). There's an unusual low frequency roll off below 50Hz too, that may make the sound a little light.

The PAW 5000 produced a relatively poor set of performance figures, worst being a dynamic range lower than CD, defeating its purpose as a hi-res player.

NK

Frequency response (-1dB)	30Hz-30kHz
CD	30Hz-30kHz
Distortion	24bit
0dB	0.007%
-60dB	0.26%
Separation (1kHz)	96dB
Noise (IEC A)	-98dB
Dynamic range	99dB
Output	1.3V



In-built DSP allows you to tailor the sound. Try Dental at your peril!

but never enough to really impress.

Turning to 'The Queen Is Dead' from The Smiths in 24/96 there was little to distinguish the file from a standard CD rip. Listening to this on my standard FiiO X3 player (which is half the price of the Lotoo) there was more scale, depth and vibrancy to the presentation.

To be fair, there's nothing to actually dislike about the Lotoo – Adele's latest '25' album, for example, glided along nicely with decent

LOTTO PAW 5000 £299



GOOD - worth auditioning

VERDICT

A slick interface and nice controls but overall the Lotoo has a rather bland sound.

FOR

- compact
- fast start-up
- easy to use
- balanced headphone output

AGAINST

- lack of dynamic range
- bland sound

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On The Fly

Colorfly were one of the pioneers of high-resolution digital audio players – but can their new C10 match recent rivals? Jon Myles decides.

Colorfly created a bit of a stir when it launched its C4 portable digital audio player (DAP) some five years ago – claimed to be the first such device capable of playing high-definition 24bit/192kHz files.

At the time the market for portable music players was still dominated by Apple's iPods and the likes of Astell&Kern had yet to emerge.

Fast forward to the present day and the landscape has changed out

of all recognition. You can now get a decent-sounding 24/192-capable DAP for £100 (the Fiio X1) and higher up the price scale, models from other manufacturers can double up as USB DACs and source components for full-size hi-fi systems.

So where does Colorfly's latest £399 C10 model fit in? Well, it ups the ante on the C4 by adding 32bit/192kHz processing to its capabilities, as well as native support for DSD 64 and 128.

Internally the player is built around a Cirrus CS4398 digital-to-analog converter allied to Colorfly's own jitter reduction circuit. Externally, the C10 features a combined wood/metal body, with an aluminium fascia and a rosewood surround on the back and sides. It looks nice and feels good in the hand, weighing in at 167g and measuring 105mm x 67mm x 19mm (H/W/D).

In contrast to many current players, controls have been kept to a minimum and made as simple as possible, all of them placed on the front panel. An old-style click-wheel arrangement has back/forward and up/down controls, while two other buttons control play/pause and system settings. Volume adjustment is handled by a sliding potentiometer to the right of the click-wheel.

Compared to some other players nowadays it looks positively old-fashioned. But, actually, that's not a bad thing as it makes the Colorfly supremely easy to operate.

Above the controls is a 2.35-inch TFT screen that lacks the resolution to reproduce album artwork so instead shows a graphical representation of a turntable.

On the top is the standard 3.5mm headphone jack plus a line-out socket. The bottom panel contains a microUSB connector for charging and loading music, plus a reset key and a microSD card slot for adding extra memory to the in-built 32GB storage.

Also included with the player is a classy leather pouch which allows access to all buttons and gives good protection when out and about. Taken as a whole the Colorfly is a classy-looking package with the wood and metal body giving it a superior look to some of its rivals.

SOUND QUALITY

The Colorfly had impressive solidity to its sound. Bass was fulsome, while the midband had a nice, rich warmth to it.

Playing The Libertines' 'Belly Of The Beast' from 'Anthems For Doomed Youth' (16bit/44.1kHz), vocals were clean and clear with nice tonality. The descending rhythm guitar at the start of the track was also well-defined. Some players can miss this detail or make it sound rather indistinct but the C10 managed to capture it well.

Moving up to higher resolution material, however, like the Lotoo PAW 5000 reviewed elsewhere in these pages the Colorfly was more of a mixed bag. The nice midrange and good low-end were still present and correct but there was not quite the extra detail I'd expected from the files.

On 'The Queen Is Dead' by The Smiths, Johnny Marr's multi-tracked guitar parts seemed to blend into one, the C10 unable to





The Colorfly was easy to use. A basic slide volume control allied to a click-wheel makes navigating through functions a breeze.

delineate between the various layers. Morrissey's voice, also, lacked some of the bite and range of other high-resolution players like the Cayin N6.

Similarly 'Mahler's 2nd' by the San Francisco Symphony in DSD sounded a little too muted on the crescendos with a lack of outright vibrancy and impact. Not that it was bad – just not as visceral as this piece can be.

Much of this was down to the



Headphone, line out and on/off buttons are on top.

CONCLUSION

The Colorfly C10 is a decent player but it's up against some tough competition at its £399 price level (although shop around and you can get it for £100 less).

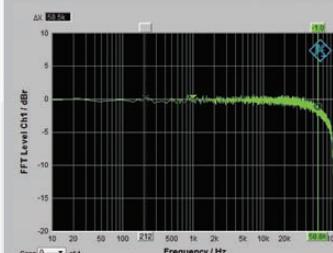
It's well built and simple to operate, the slider volume control being a plus point. Its sound though,

MEASURED PERFORMANCE

The Colorfly C10 produced 2.5V at its headphone socket, plenty enough to deliver high volume into all headphones, including insensitive Planar Magnetics. The Lo output produced 1.6V – still loud.

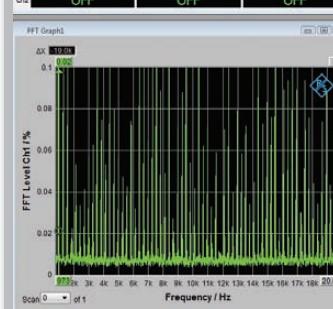
Distortion at full level (0dB) measured 0.001% but at -60dB it measured an unimpressive 0.14% with

FREQUENCY RESPONSE



DISTORTION

THD at 0 %	Level RMS	Frequency
0.1452 %	2.5475 mV	997.00 Hz



24bit digital, where around 0.1% or less is common from a budget product at -60dB. Our analysis shows an array of distortion and quantisation noise products from the DAC – uncommon nowadays.

As a result of high distortion, EIAJ Dynamic Range (24bit) was mediocre at 103dB from the headphone output (and Lo output), the same as CD. So the Colorfly C10 delivers CD quality from hires – unimpressive. Players like Fiio's X3 manage better (115dB) at lower cost.

Frequency response with 192kHz sample rate reached 60kHz (-1dB) with an upper limit of 96kHz, the half-sample rate limit.

The Colorfly C10 produced a decent set of performance figures, ignoring a dynamic range the same as CD, compromising its purpose as a hi-res player supposedly better than CD. **NK**

Frequency response (-1dB)
CD 4Hz-60kHz

Distortion	24bit
0dB	0.001%
-60dB	0.14%
Separation (1kHz)	99dB
Noise (IEC A)	-104dB
Dynamic range	103dB
Output	2.5V

COLORFLY C10 £399



GOOD - worth hearing.

VERDICT

A good-looking, solid player whose plus points are build quality and ease of operation. Sound-wise, though, it's bettered by many rivals.

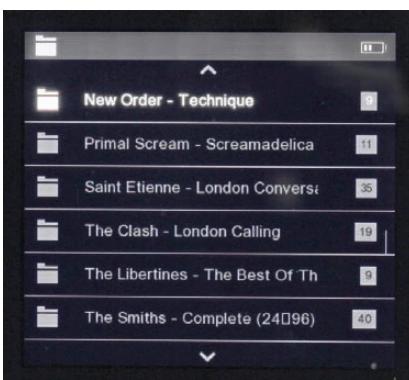
FOR

- build
- simple controls
- good bass
- drive

AGAINST

- limited dynamic range
- basic screen

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The Colorfly's display is rather basic - but all the better for it.

fact that the Colorfly doesn't have the greatest dynamic range – one of the most important elements when replaying high-resolution files (see Measured Performance for more details).

On the plus side the C10 has plenty of power – able to push both Noble K10 in-ear monitors and Focal Sphears to prodigious levels. It also had the drive to handle a pair of Oppo planar magnetic over-ear 'phones with ease. The slide volume control was accurate too, so setting level was a breeze, unlike other models which use up/down buttons.

while perfectly acceptable, fails to really shine, lacking the definition and dynamic range to get the best out of high-resolution material.

Buy a DAP

Why buy a high-resolution digital audio player? And is it worth it? Jon Myles guides you through the options.

High-resolution digital audio players (DAPs) can serve many functions. At their most basic they'll allow you to listen to CD-quality files and above through headphones while out and about. At the more advanced level they will do this and also have the capability of replacing - and bettering - a CD player as a digital source in a home hi-fi system.

Which makes choosing the right one for you all the more important - especially as prices can range from less than £100 to over £1500 for something like Lotoo's PAW Gold.

So what do you need to look for? A few simple steps will help make the right choice.

First of all, assess your needs. If the main aim is to have a player which can store and play back high-resolution files while you are out and about then features such as line-out may well be superfluous.

However, if you want to use a DAP to bring

high-resolution playback to an existing hi-fi system then this is a crucial factor (see Noel Keywood's feature on page 21 for full details).

Also, consider what resolution most of your music collection consists of and what you think you'll be buying in the future. There's no point spending extra on a 32bit/192kHz, DSD-capable player if you don't possess any music in this resolution - and don't think you ever will.

In which case something like FiiO's X1 can be had for £99. It's small, supports high-resolution up to 24bit/192kHz and has enough power to drive even demanding over-ear headphones such as Oppo's PM1s.

Bear in mind, though, that it has no in-built storage, so you'll need to factor in the cost of buying a microSD card. The cost of these has dropped sharply recently, so 64GB cards can be had for as little £25 if you shop around. Which means you can have a thoroughly competent high-res player with enough storage for a selection of your favourite



Some DAPs do not have built-in memory so a microSD card will be needed - although the price of these is dropping all the time.

Lotoo's PAW Gold is at the top end of the DAP range at £1500 - but offers exceptional performance.



albums for £125.

However, if you want to spend a little more, a DAP can become an integral part of your hi-fi system - and also be taken out and about.

Move up in the price range and the likes of Astell&Kern's AK100 (available for around £350 if you look around) give the option of an optical digital output, straight line out and 32GB of internal memory. So, most importantly, it can replace your CD player as a source. With a dynamic range of 110dB it betters that of silver disc players and can be plugged into your home system for playing back high-resolution files.

But there are some important things to bear in mind. All DAPs, by their very nature, are small and don't have the convenience of a CD player with a remote control. You'll have to cross the room to change tracks or select an album if you have your player plugged in.

But then again, they have the ability to play files at a resolution which was unheard of when CD was launched way back in 1982.

LOADING MUSIC

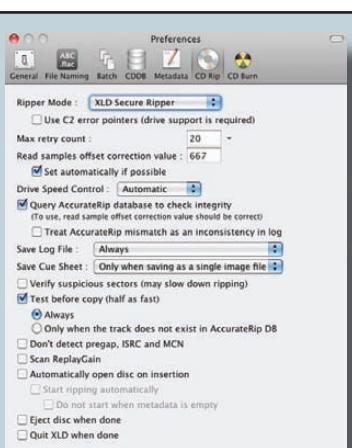
Getting your music onto a high-resolution audio player is easy. Yes, you'll need a computer - but all DAPs come with the required leads for connection.

Then it's merely a case of dragging and dropping the required files from your PC/Mac onto the device.

Do bear in mind, though, that DAPs are not inherently clever - meaning they won't magically know you've loaded 'Mahler's 5th' or the latest Taylor Swift single onto the device unless it has been labelled as such.

There's various ways of doing this. Most high-resolution downloads come with the requisite information - but at times they are not perfect. Which means a little tinkering can help. So I'd recommend the free XLD download which allows you to change track names, album listing and even cover art for files before loading them onto your DAP.

It takes a little time to get used to, but once done it will enable you to tailor your DAP to exactly how you want it to display your files.



XLD can be used to help tag your files correctly.

DAP your hi-fi

They may be small and portable - but a digital audio player can also provide a high-resolution boost for your current hi-fi system. Noel Keywood explains all.

Since Astell&Kern roared onto the scene with their ear-popping AK100, that I reviewed in our March 2013 issue, portable Digital Audio Players – often abbreviated to DAPs – have taken off in popularity. And it's hardly surprising: they now play just about any and every digital format ever invented, offering fabulous sound quality in the process. There's nothing quite like them in fact; even fully blown and expensive hi-fi DACs that do half the job struggle to compete, yet a DAP will cost you anything from £100 for a FiO X3, to £1500 for a Lotoo PAW Gold. By hi-fi standards this is no king's ransom.

If you're interested in a DAP, here's what to look for.

For use in a hi-fi system the player must be able to play whilst powered by an external power supply – and not all can do this. It is a fairly recent requirement so whilst new designs will usually play whilst connected to an iPhone charger or USB power supply charger, older designs will either charge or play, but not both at the same time.

How to connect to a hi-fi? Ideally, from a digital output into a hi-fi DAC, but only if the hi-fi DAC is at least as good as the one on-board the player. If it isn't then you may well be best off connecting up the analogue headphone output to your amplifier's Aux, Tuner, or Tape input, or in other words, a line input.

How to tell? Currently, DAPs commonly use low current consumption digital convertor chips (DACs) designed for portable use. They are cheap and they preserve battery life, but they are also noisy and have limited dynamic range, typically 110dB-115dB (CD is 103dB). Mains powered hi-fi DACs, like Audiolab's M-DAC (£800) equipped

with an ESS 3018 Sabre32 chip, manage 120dB, a clear advantage. So you'd be best off connecting up a player like the FiO X3, via its digital S/PDIF output to an Audiolab or similar quality DAC.



Use an adaptor lead to retrieve audio from the headphone or line output of a digital player. A wide variety of 3.5mm jack to phono plug or socket terminations are available.

If your hi-fi either possesses no DAC, or an old DAC, then you are probably best off connecting a DAP to it using either its headphone output, or a Line output if available.

What's the difference? The headphone output goes through a volume control, whilst the Line output does not; volume is fixed. The signal path is (or should be) shorter, and dynamic range a tad higher, so Line is better.

There's always enough output, by the way: most DAPs produce 1.5V-3V out, from headphone or Line, and this is more than enough to drive any Line input. It is also enough to drive power amps direct as well, since most need 1V.

How to connect up? You need an adaptor lead with 3.5mm stereo jack plug at one end, to mate with the player, and phono plugs at the other to plug into the hi-fi amp.

You can get these at Maplins, on line, or from a hi-fi dealer. An alternative is a one-piece 3.5mm plug to phono socket unit, but I find these less sturdy and sometimes intermittent. An adaptor cable puts less strain on the player's output sockets, that are often a tad fragile.

If you use a headphone output, turn volume to maximum on the

player, because this gives best sound quality from digital controls. Obviously, turn your amplifier's volume down first!

DYNAMIC RANGE

This is a measure of noise plus distortion, relative to full output. It's a very good way to measure digital devices in particular, because a low level (-60dB) test tone is used – and digital systems are at their worst at low levels.

Consequently, dynamic range values correlate well with sound quality: all the best sounding DAC chips have very high dynamic range, and so do the best sounding DAPs. We measure dynamic range with an advanced Rohde&Schwarz UPV analyser so you can be assured our figure is correct and meaningful.

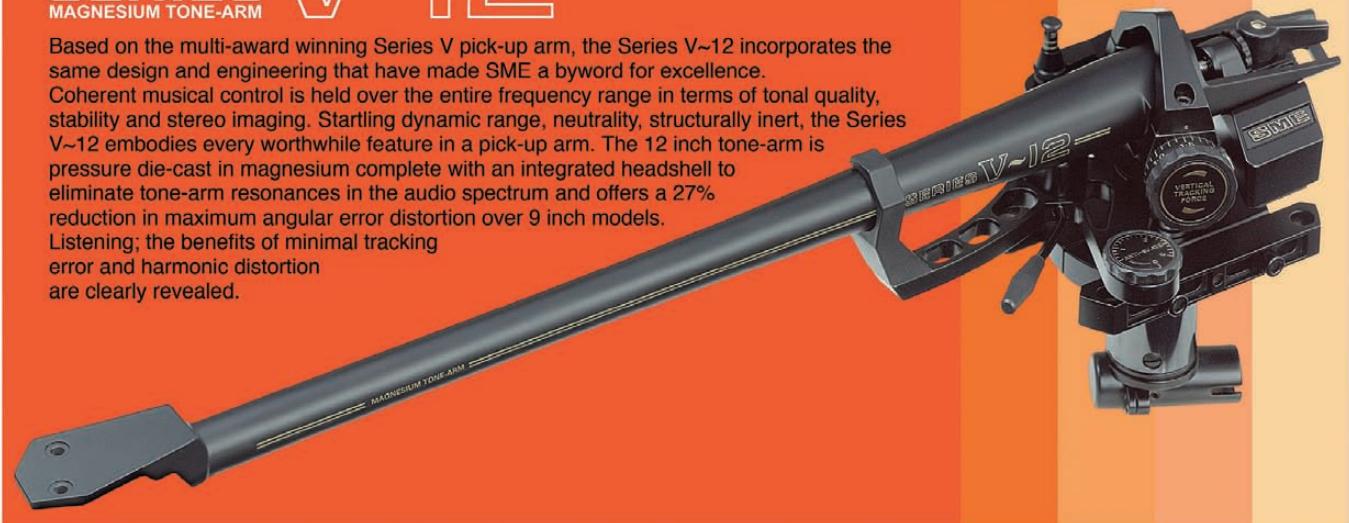
Of course, there are other factors that affect sound quality, especially the all-analogue headphone drive chip and the power supply, where these days line voltages are established by DC-DC convertors.

But both components affect noise and distortion figures, so influencing dynamic range, hence why this is a good guide to quality. So always look for the critical dynamic range value when assessing a DAP: it's a guide to goodness.

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Quad's new S2 standmount 'speaker marries a ribbon tweeter to a conventional mid/bass driver to glorious effect, says Jon Myles.

Golden Ribbon

Mention Quad and loudspeakers to anyone with even a passing knowledge of hi-fi and the term electrostatics will invariably pop into their mind. After all, together with a legendary series of valve amplifiers, that is where the brand really forged its reputation.

Less well known, however, is that the company's first loudspeaker was something rather different. It was a single corner unit launched in the days of mono reproduction way back in 1949 whose main selling point was its use of a ribbon tweeter to bring extra extension to the high frequencies.

Unfortunately, I've never heard one – but it seems what goes around

comes around. That's because the main distinguishing feature of Quad's latest S series of loudspeakers is the use of a ribbon tweeter once again.

The range includes two small standmounts – the larger of which is the S2 on review here – a pair of floorstanders and a centre channel 'speaker for use in home A/V systems.

Looks-wise the S2 is distinguished by the aforementioned ribbon tweeter that sits above a 125mm woven Kevlar mid/bass driver. The 'speaker itself measures 330mm x 180mm x 260mm (H/W/D) and the cabinet uses a sandwich construction of alternate layers of MDF and high-density particleboard for maximum rigidity. Black or Sapele mahogany finishes are available, while hand-

lacquered piano white and piano black come as an extra-cost option. Rounded edges on the front and rear add an air of sophistication to the package.

Round the back are two pairs of loudspeaker binding posts to facilitate bi-wiring if required, and a small reflex port to squeeze some extra bass from the 8.15 litre cabinet.

In typical Quad style the S-2 is purposeful looking without being too flashy, and build quality is high for its £599.95 price tag.

SOUND QUALITY

Quad's traditional box-style loudspeakers have always had a distinctive sound – smooth, sophisticated and (to some ears) a little laid-back.

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Conventional high-end preamplifiers are the direct descendants of preamps that were conceived decades ago in a pre-digital world. The CP-800 stereo preamp/processor is something new. It combines the key circuit blocks of a high-end audio system in a unique way to improve and shorten the signal path. Analogue purity is preserved while digital sources acquire new processing features and higher performance than ever. For the first time, a CD ripped to a computer can sound better than it would if played in the world's best CD player.

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Then hear the CP-800 for yourself
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CLASSE

Classé — every detail matters.

The S2s do not veer from this too much, but the addition of a ribbon tweeter adds a welcome extra degree of sparkle to the top end without making the 'speaker sound brash or edgy.'

Integrating a ribbon with a traditional cone mid/bass is not the easiest of tasks because of difficulties at the crossover frequency but the S2 seems to have got it just right.

There's no sense of listening to two different drive unit technologies at play – instead just a smooth, seamless sound that trades on detail and punch.

They do need a decent run-in, though, mainly to loosen up that Kevlar mid/bass unit. Out of the box



Quad's ribbon tweeter gives a welcome lift to high-frequencies – but is well-balanced and not too bright or edgy.

I thought they sounded a little bland and unexciting but after a week's use things really started to gel.

Used on the end of an Audiolab 8300A integrated amplifier (see review elsewhere in this issue) fed from a variety of sources, the S2s impressed me with a coherent, musically-engaging performance on all genres of music. They won't blow your socks off with earth-shattering bass or scorch your eardrums with searing treble but instead just sound remarkably assured.

Playing The Clash's 'Hitsville UK' (24/96) from 'Sandinista' there was great dynamic range on offer from such a relatively small loudspeaker. Paul Simonon's bass swung low with a rich tonality while the tinkling piano line had the sort of bite you just won't hear from a conventional tweeter.

It's not the most explicit ribbon

design I've ever heard, but that does mean it never sounds edgy or overly strident. It's a trait that plays well with well-recorded female vocals, Sinead O'Connor's voice on her 'Sean Nos Nua' collection of Irish ballads having spine-tingling air and space around it.

Imaging was also impressive, the Quads pushing instruments forward into the room with a good left/right spread that gave an expansive soundstage.

They'll also go loud with impressive ease (see Measured Performance for full details). Turning the Audiolab up on the English National Opera's recording of Britten's 'Peter Grimes', the massed ranks of the chorus stayed true and focussed as the volume level was pushed higher. In fact, closing my eyes it was easy to think I was listening to a much larger loudspeaker.

A little care with set-up and positioning also helps squeeze some extra performance from the S2s. Move them closer to a rear wall and bass becomes more fulsome without taking on a horribly boomy quality.

Also look to replace the metal links on the 'speaker binding posts if you are not bi-wiring. I substituted them for a pair of Tellurium Q Silver

Diamond jumpers which – at £480 a pair – may seem slight overkill but actually brought an extra degree of detail and openness to the overall sound.

Even without that tweak, though, the Quad S2s are a more than accomplished set of loudspeakers that are a richly enjoyable listen.



Twin sets of loudspeaker binding posts allow for bi-wiring if required while the rear-facing reflex port is tuned to 35Hz for additional bass boost – although near-wall placement is recommended.

CONCLUSION

Quad has definitely hit the mark with the S2s. They have a smooth, vibrant sound that is refreshingly uncoloured and never less than engaging. Partner them with a similarly-priced amplifier and you'll have a fantastic set-up.

MEASURED PERFORMANCE

The Quad S2 measures reasonably flat across the audio band our analysis shows. There's no dip in the crossover region around 3kHz so reproduction of detail will be strong; the reverse in fact output lifts a little in this region as the ribbon tweeter comes into play. There's also some lift at higher frequencies from the ribbon tweeter, in all making the S2 brightly balanced, and likely forthright in its sound.

The mid-band is smooth, suggesting low coloration, whilst bass frequencies fall away slowly to a lower limit of 40Hz – a common trait in bookshelf / standmount loudspeakers meant for near-wall placement. It provides compensation for the raised modal support this position invokes, driving a room well. The small port (red trace) is tuned quite low, to 35Hz, and offers broad acoustic damping our impedance trace shows by the width of its dip around this frequency. This suggests good bass quality, but the S2 is not bass heavy by any means; port output was low in SPL and acoustic power terms.

Sensitivity measured a high 87dB sound pressure level (at 1m) from one

nominal Watt of input (2.8V), allowing the S2s to play loud from 40 Watts or so. Nominal impedance measured 7 Ohms.

The S2 is a well balanced design measurement shows. It will have a relatively dry and forthright sound with restrained but good quality bass. It is balanced for use against a rear wall. **NK**

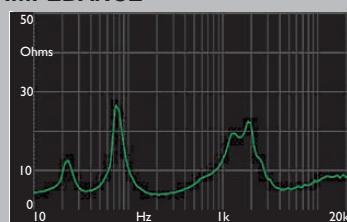
FREQUENCY RESPONSE

Green - driver output

Red - port output



IMPEDANCE



QUAD S2 £599.95



OUTSTANDING - amongst the best.

VALUE - keenly priced.

VERDICT

The ribbon tweeter-equipped Quad S2 is a sumptuous sounding loudspeaker that blends accuracy with sonic sparkle in a room-friendly package. Hard to beat at the price.

FOR

- detailed, open treble
- smooth mid-range
- rich bass
- appearance

AGAINST

- needs careful positioning

Quad

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Viva Libra



Leema's new Libra is a high-resolution DAC and preamp with analogue inputs to boot. Jon Myles thinks it offers exceptional value.

Anyone hunting for a stand-alone DAC to form the digital hub of their hi-fi system is spoilt for choice nowadays. Not so many years ago DACs were used primarily to upgrade the performance of an existing CD player. But the rise of digital downloads, music streaming and computer audio has changed the landscape. Now there's a huge variety of digital-to-analogue converters, ranging from the decidedly minimal with limited inputs and few features, to exotic components boasting an array of connectivity options plus features such as volume control, digital filters and Bluetooth connectivity.

Even a cursory look at Leema's new £5995 flagship Libra DAC will leave you in no doubt as to which of those categories it fits into. The back panel alone reveals this is a product firmly aimed at those who take their digital replay seriously.

So connection options include six S/PDIF (three coaxial, three optical) digital inputs, USB, two AES/EBU digital S/PDIF balanced inputs, Bluetooth and a pair of the rare

I2S inputs via RJ45. And as the Libra is also positioned to act as a fully-featured pre-amplifier you also get a three-input analogue section via RCA type phono sockets (unbalanced) or balanced XLR. Output is available on both RCA and XLR while the Libra also incorporates the proprietary LIPS (Leema Intelligent Protocol System) protocol so the unit can be used to control other products from the company's range.

All the S/PDIF inputs will accept files up to 24bit/192kHz as well as DSD 64 while the USB input can also decode DSD 128 (using the DoP framework) as well as DXD at 24bit/352.8kHz and PCM at 24/384. Leema have also provided digital filter settings to get the best out of high-resolution material – with choices of normal, wide (which allows frequencies over 40kHz to be passed) or auto.

In contrast to the heavily-laden rear, the front of the Leema is refreshingly clean and uncluttered with a large liquid crystal display panel in the centre flanked by rotary controls for volume and selecting inputs/menu scrolling and four small

buttons to select various functions such as home theatre by-pass and mute. There's also a headphone jack and a 3.5mm input for connecting a mobile phone/tablet or portable player.

All this is housed in an attractive-looking metal case measuring 110mm x 440mm x 320mm and weighing 15kg - making it look more like a classy integrated amplifier than a DAC/preamp. The supplied full-function remote is also an all-metal affair which feels weighty and substantial.

As ever with Leema, the standard of construction is excellent with all the controls having a nice smooth action while the menu system is pleasingly easy to navigate after a little practice.

SOUND QUALITY

Leema says the Libra is fully balanced throughout in both digital and analogue – so I used its XLR outputs to connect to a Creek Evolution 100A integrated amplifier, or a pair of Quad QMP monoblocks, via a pair of the transparent-sounding Tellurium Q Ultra Silver interconnects.

Playing straight CD with the Leema acting as a DAC/preamp first impressions were of a detailed, insightful sound with a distinctly smooth tonal palette.

On The Other Two & You's 'Tasty Fish' Stephen Morris's drums were tight and propulsive while Gillian Gilbert's keyboards had an ethereal, floating quality. This is a rather lush recording which can sound a little too mellow via some DACs but the Libra managed to cut through that to reveal the natural tone of the instruments.

In that respect it's a little reminiscent of some of Chord's digital convertors – erring on the side of accuracy as opposed to any unnatural warmth. Don't take that to mean it sounds clinical, though – more that it manages to get to the heart of a recording in a very clean and open way.

On the dense dose of swamp rock that is Led Zeppelin's 'When The Levee Breaks' the Libra stripped back the layers so I could clearly hear the guitar, bass and harmonica lines above John Bonham's thunderous drum track. I've heard other DACs costing more than the Leema turn this into a stodgy sonic stew but here there was excellent instrumental separation

which served to highlight the dynamic thrust of the song.

That quality persisted when I moved up to higher-resolution material. On Kate Bush's '50 Words For Snow' in 24bit/96kHz the bass was powerful but sinuous and tuneful, while vocals were harmonically rich without being overly smooth so as to rob them of bite. Soundstaging was also impressive, the image extending well beyond the plane of the 'speakers with good image depth. Here I had the digital filter set to wide – which seemed to always give the best result.

If there's one criticism to be made it's that the Leema Libra doesn't have the outright resolution of something like the £4500 Resonessence Invicta Mirus DAC/preamp – which uses two ESS Sabre DAC chips to impressive effect and seems to extract just that little bit extra from the music and has a lovely organic flow.

However, the Leema is better equipped in terms of connections – which could be crucial for many users. And the addition of analogue inputs is also a bonus. Pressing these into use it's clear the Leema's preamplifier section is of good quality. Fed Willy DeVille's 'Spanish Harlem' from an Oppo BDP-105D there was

no masking of detail – just palpable air and atmosphere around DeVille's gruff vocals and sparse piano backing. The 248-step volume control also makes setting exact level extremely easy.

Then there's Bluetooth functionality. The Leema paired with my iPhone 6, iPad and MacBook Air in seconds and its distinctive sonic signature was again evident – insightful and smooth without ever sounding bland.

OK, for serious listening sessions Bluetooth would never be my medium of choice but its convenience can't be denied and the Leema gets the best from it.

CONCLUSION

At a shade under £6000 the Leema Libra is obviously a premium product – but its range of capabilities fully justify the price.

With both digital and analogue inputs, preamp, DSD processing and Bluetooth it has everything needed to serve as the central hub of a very good hi-fi system indeed. More importantly it sounds good from all sources – with a detailed, vibrant presentation whatever input is used. As a total package it's an extremely impressive piece of equipment.

MEASURED PERFORMANCE

As a DAC the Libra managed its best performance from its XLR output set to Fixed, that delivers 4V. Dynamic Range with 24bit digital (AES balanced digital

input) measured 113dB – unexceptional. Around 115dB-120dB is common and over 130dB possible in a top DAC like the Resonessence Invicta Mirus, or Wadia di122, against which the Libra is positioned.

Switching in variable output that has an amplifier able to deliver 20V at full volume degraded this -3.5dB, so using variable output with volume control carries penalties.

The unbalanced phono output set to Fixed (2V) measured an even lower 107dB Dynamic Range – very low for an expensive high-end DAC. The USB input achieved 110dB Dynamic Range.

Frequency response with a 192kHz sample rate digital S/PDIF input extended to 42kHz (-3dB), exactly as specified. With the filter set to Wide this moved up to 80kHz, again as specified. The USB input achieved the same result, with both filters. So the Libra gets the full analogue bandwidth expected from high sample rate digital.

The optical inputs accepted 192kHz sample rate too, where many still work to 96kHz and no more, limited by the input receiver. The Libra will work with optical output on Astell&Kern digital audio

players, where many DACs still will not – a plus point.

Distortion was low at 0.04% (24bit, -60dB) if not class leading, and with CD 0.22% was as expected due 16bit quantisation noise.

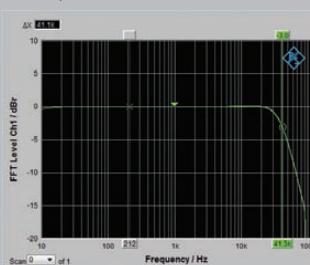
Preamplifier gain was x5, via phono socket or XLR inputs. Since a gain of x3 is typical, this is a useful figure. With 20V maximum output via XLR and 10V via the unbalanced phono socket, plus wide bandwidth (100kHz) and low distortion (0.001% at 1V in), as well as low noise (-113dB) the preamp measured well all round.

The Libra's many stages all measured well, except for intrinsic dynamic range that lags competitors by up to 20dB – a big gap. **NK**

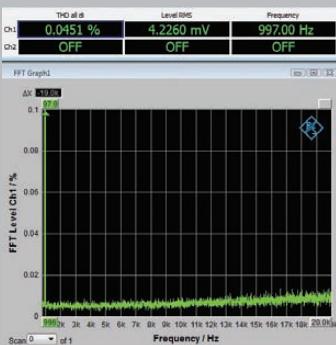
Frequency response (-1dB)

CD	4Hz-80kHz
Distortion (%)	24bit
0dB	0.002
-60dB	0.04
Separation (1kHz)	111dB
Noise (IEC A)	-111dB
Dynamic range	113dB
Output	
(Phono/XLR; fix/var)	2/4 10/20 V

FREQUENCY RESPONSE



DISTORTION



LEEMA LIBRA

£5995



EXCELLENT - extremely capable.

VERDICT

An impressively-specified DAC/preamp that has good sound and great flexibility.

FOR

- detailed, engaging sound
- preamp
- Bluetooth

AGAINST

- limited dynamic range

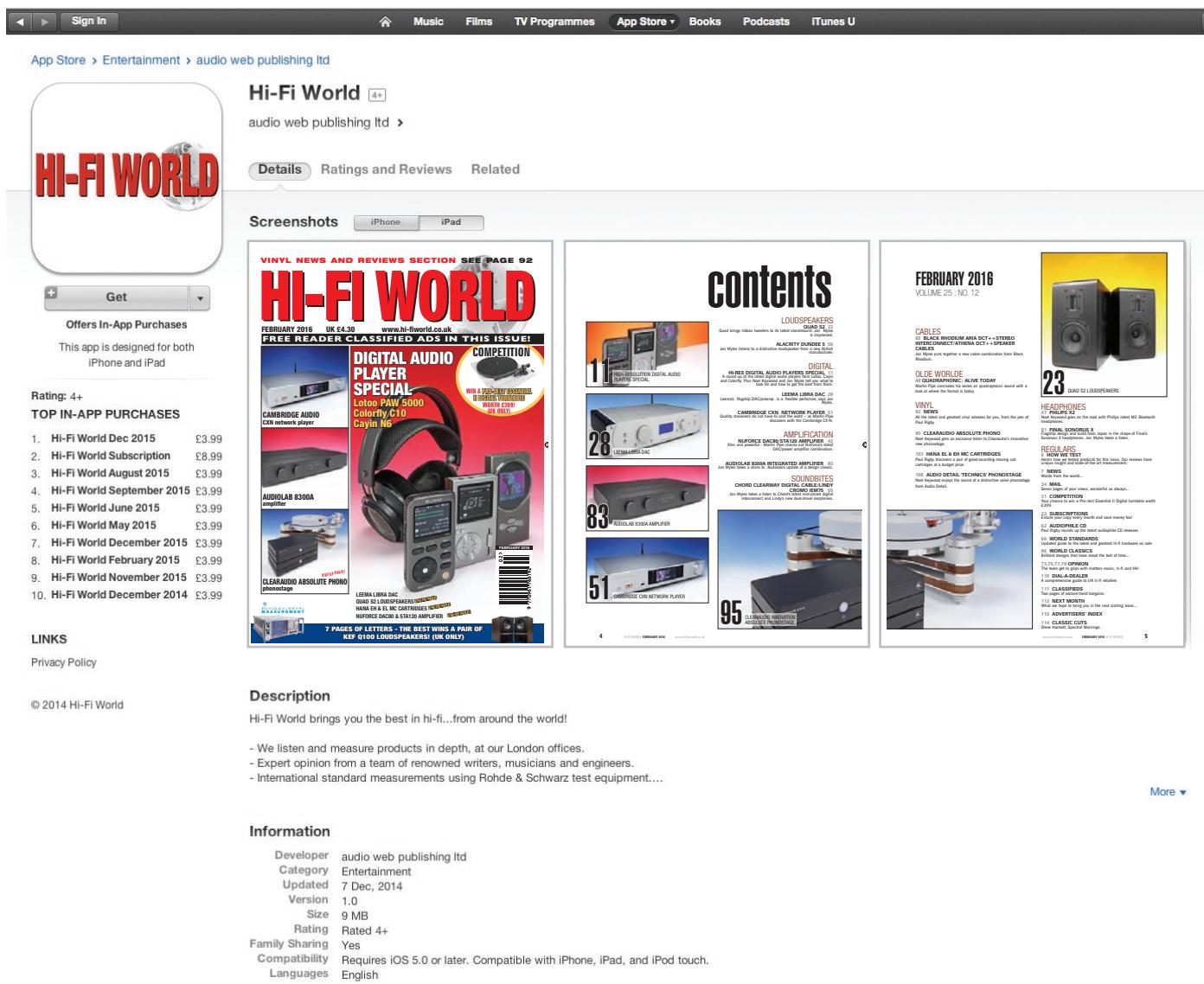
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The screenshot shows the 'Hi-Fi World' app page on the App Store. At the top, there's a navigation bar with 'Sign In', 'Music', 'Films', 'TV Programmes', 'App Store', 'Books', 'Podcasts', and 'iTunes U'. Below the navigation is the app's icon, which is a silver globe with a grid pattern. The app's name 'Hi-Fi World' is displayed in a large, bold, red font. Below the icon, there are buttons for 'Get' and 'Offers In-App Purchases'. A note says 'This app is designed for both iPhone and iPad'. The rating is 'Rating: 4+' and 'TOP IN-APP PURCHASES' are listed. The 'Details' tab is selected, showing the app's description: 'Hi-Fi World brings you the best in hi-fi...from around the world! We listen and measure products in depth, at our London offices. Expert opinion from a team of renowned writers, musicians and engineers. International standard measurements using Rohde & Schwarz test equipment....'. The 'Screenshots' tab shows a preview of the magazine's layout with various audio components and reviews. The 'Ratings and Reviews' tab shows a 4.5-star average rating with 1,000 reviews. The 'Related' tab is also visible. On the right side of the page, there's a 'contents' section for the February 2016 issue, a 'FEBRUARY 2016' section with a thumbnail of speakers, and a 'LINKS' section with a 'Privacy Policy' link. At the bottom, there's an 'Information' section with developer details and a 'More' link.

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WIN PRO-JECT SUPERB ESSENTIAL II DIGITAL TURNTABLE IN THIS MONTH'S GREAT GIVEAWAY WORTH £309!

Here's your chance to win a fabulous Pro-Ject Essential II Digital turntable that we reviewed in our October 2015 issue. Read the review excerpt below and answer the questions.

"The Essential II Digital has both analogue and digital outputs, the latter being for recording purposes. It means you can digitally archive your vinyl and / or load it to a portable to make the commute easier to bear.

There haven't been any unacceptable compromises: it didn't bulldoze the grooves of my LPs. Far

from it, the budget Ortofon OM5E cartridge fitted tracked incredibly well under test, so there will be no groove damage from mis-tracking – something I think I need to assure you about straight away. There's no point in buying a budget technowonder if it's going to chew up the LP collection after all, and budget cartridges can do this. But onto a basic description...

The Essential II Digital is a two speed turntable, spinning at 33 and 45 rpm. It has a good, friction free arm that isn't the best finished you'll encounter; don't expect a Rega, let alone an SME. But I don't mind simple but effective design along well tried

lines – and this is what the arm gives you.

The fitted Ortofon OM5E cartridge can be described likewise: it is a well honed lightweight Moving Magnet (MM) design with elliptical stylus that tracks at a recommended 1.75 gms. And in tests it never mis-tracked once, even on torture tracks. It does have a warm sound balance, but this is likely what people new to vinyl will expect. The arm could well take a better cartridge, right up to Ortofon's top MM, the 2M Black (£400) or a good Goldring or Audio Technica."

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QUESTIONS

[1] What did it not do?

- [a] turn around
- [b] play music
- [c] bulldoze grooves
- [d] change speed

[2] The cartridge fitted is an –

- [a] Shure M3D
- [b] Acos ceramic
- [c] Lyra Titan i
- [d] Ortofon OM5E

[3] How many speeds are there?

- [a] Two
- [b] One
- [c] Reverse
- [d] Indeterminate

[4] The arm is free of –

- [a] muscle pain
- [b] sun rash
- [c] friction
- [d] shake

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LETTER OF THE MONTH PRIZE



KEF Q100 LOUDSPEAKERS

Answers by: **NK** - Noel Keywood; **JM** - Jon Myles; **PR** - Paul Rigby; **MP** - Martin Pipe; **RT** - Rafael Todes.

For more advice see Letters from earlier issues at www.hi-fiworld.co.uk/letters

**A pair of KEF Q100 loudspeakers are on their way to JAMES DOUGLAS
Letter of the Month winner in our January 2016 issue.**

Letter of the Month

SAVE ME

It's got to that time to replace my Dynavector DV-20XH. It was my first moving coil (MC) and I have been generally pleased with it. The Dynavector sits in an Origin Live Ultra with upgraded bearing, Origin Live L2 arm, cartridge isolator and feeds a World Audio Phono II/Pre-amp II and World Audio K588I, slightly modified.

Finding out I am supposed to replace a Dynavector every 3 years has made me carefully consider what I should do next. Not having an MC input restricts my choice a bit, but for the cost of Dynavector trade-in I could get MC transformers and an AT-33EV, but an elliptical stylus doesn't last as long as the DV20XHs micro-ridge?

One problem I have had with the DV20XH is sibilance - Joan Armtrading's eponymous album end of side tracks for instance (Save Me and Tall in the Saddle!). Careful adjustment of VTA has reduced it beyond what I had with previous cartridges but I have always suffered from it. Ideally, what I want is a low output cartridge + transformers, or high output cartridge, with low noise, fine profile stylus, no sibilance, less than £400. (I could sneak up to £500 if the wife isn't looking, or drunk).

*Simples.
What do you suggest?
Regards,
Robin Irwin*

Hi Robin. I hope the wife doesn't read Hi-Fi World or you may wake up to a bent stylus. Best this happens to the outgoing Dynavector methinks.

Incoming to replace it should be a low output MC, either with external MC phono stage or transformers (quieter, but usually expensive if any good).

In your case you are best using transformers feeding the World Design's Phono II but these will consume much of your budget. For DIY purposes check out Rothwell, Sowter and Jensen, all well known and respected. Music First Audio wind their own very high-quality types and Icon Audio have their MCTX. There's plenty of choice thankfully, because good transformers offer lowest noise and best sound quality from MC cartridges.

I recommend you get a 'proper' low output MC because they track better than high output designs - see our review of the Hanas in this issue; these cartridges may interest you.



Dynavector DV-20XH - a high output moving coil (MC) cartridge suitable for the MM inputs of valve phono stages.

The sibilance you mention on vocals is likely caused by mis-tracking, a classic problem with high output MCs. By happenstance, we have two high-ish output MC cartridges in this issue, the da Vinci V2 from Clearaudio and the Hanas EH, and both had limited mid-band tracking ability of around 18cms/sec at 1kHz, where a low output design with smaller, lighter coils will these days clear 25cms/sec - a 40% improvement no less.

Unfortunately, once a cartridge mis-tracks it imprints damage into the groove wall and you'll continue to hear this with a new, better cartridge able to track securely. Possibly one of your earlier

cartridges imprinted the damage; whatever, it is permanent and you will suffer it always.

A classic budget MC cartridge is Denon's DL-103. Although costing a measly £210 or so, it has a big, full bodied sound and exhibits classic MC qualities such as a sense of spaciousness, unlike so many budget MCs that often sound crude and lacklustre.

I still feel Audio Technica's AT OC-9 MLIII (£450) is one of the best budget designs, at least for punchy Rock, but the AT-33EV is fine value at £380.

You have a wide choice available nowadays as vinyl continues its journey upward, back into mainstream popularity.

Oh, and I recommend a Shure M97xE for your wife (!). **NK**



Audio Technica AT OC9 MLIII,
an impressive MC cartridge with
fine treble and punchy bass.

I echo Noel's recommendation of the Denon DL-103 and would agree that it has a surprisingly high-quality sound for the price. It is well worth auditioning but please listen to the Hana cartridges featured in this issue if you are able. They shocked me with their smooth and inherently mature sound qualities. Both offer a slightly different viewpoint on musical reproduction and you can see just how within the reviews but either will bring a smile to your face and possibly a song from any slightly happy spouses in the immediate vicinity. **PR**

DECCA AT HALF SPEED

Paul Rigby reminisces in the December issue (p69), about the "London" label. This was used by British Decca in the US (and Canada and Japan) as rights to the Decca name were owned by an American company (both are now part



Icon Audio MTX MC transformers – they step up the small signal from an MC so it can be connected to an MM input. Use them between an MC cartridge and MM phono input.

of the Vivendi Universal conglomerate). The discs (classical at least) were pressed here but with American sleeves. From 1957-67, Decca handled UK/European recording, pressing and distribution for RCA.

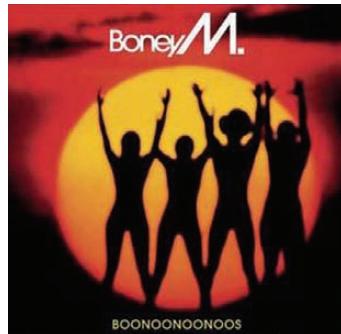
The box on p83 ("Queen" review) mentions the late Stan Ricker, pioneer of half-speed mastering in the '70s. Following WW2, Decca built on their experience with submarine detection to launch "Full Frequency Range Recording"; with their introduction of LPs in 1950, there were complaints that high frequencies were less incisive, so from the late '50s they used half-speed mastering, but without making a fuss about it. Low frequencies were now less well defined, so they modified their microphone layout to put spot/area mikes on the timps and low strings. Dissatisfied with their early stereo cutting heads, they remastered much of the catalogue from the mid-'60s (the Decca logo was changed from a "quarter-moon" to a rectangle; contrary to some collectors, I think the later ones sound better).

I hope the Editor (p67) will forgive my mentioning that Saxony is in the far east of Germany!

Kind regards,
Mark Hodgson

From what I can make out during my own research, there have been quite a lot of attempts to establish half-speed mastering from a range of labels and even independent music production companies. A number of people have had half-speed mastering gear. I believe that included, of all people, the managerial outfit backing the pop group Boney M! Take a closer look at some of their first pressings including their 1981 LP Boonoonoonoos.

Most attempts at establishing a workable and profitable half-speed system tended to head off down a sonic cul-de-sac because, as half-speed guru Miles Showell himself will tell you, having the kit is only half the job. Creating successful and consistent half-speed masters is an art and takes years of hard work to perfect. This is why Ricker (and now Showell) were/are so successful. In fact, Showell, although recognised as the world's recognised specialist in the subject, admitted that he is still learning his craft. **PR**



Even Boney M did it – master at half-speed that is.

Thanks for that Mark. I had Old Saxony in mind, where the Saxons came from, whereas Silicon Saxony is in fact centred on Dresden, in the Eastern state of Saxony as you correctly point out. It's all a bit confusing to a simple Brit like me! **NK**

BULLET PROOF

There isn't much humour in hi-fi: it's a dry subject with high prices and a minefield of variables. To minimise the last two my plan is to use the principle of simplicity i.e. the minimum of components etc. and build a vinyl

system around my power amp (AMS50) – which I understand is, technically, the logical place to start.

I've come across phono stages that have volume controls, allowing direct connection to a power amp. So a tubed phono stage with a quality volume control, coupled with the best source my budget allows, seems to be the way to go. Would such a minimalist system sound significantly different than a typical one?

As for humour I have found some, though from an unexpected place. After many auditions and thanks to Hi-Fi World I checked out some ribbon speakers. They have, as you say, a great sound (for me second only to electrostatics which, sadly, space doesn't allow). They were the Chiara speakers: made from tankwood (panzerholz) they say is literally bulletproof...and by Kaiser! Well, I had to laugh (as a Pole perhaps I shouldn't have). Though their price isn't funny.

Anyway, while not seeking other military grade components, at least not literally, I don't suppose my plan is bulletproof. Please shoot it down before I splash the cash. Yours sincerely,

Stefan Koscinski

Hi Stefan – and thanks for more allusions to East European history. It's all heating up a bit right now; I read German newspapers in the morning to see what's occurring (translated by Google I must add) and there's plenty about Poland too of course. Suddenly the UK seems like a nice, quiet place to be.

Regularly I hook up our Icon Audio PS3 valve (tube) phono stage, with volume control, to our Quad Elite QMP Monoblock power amplifiers to form a nice, simple vinyl system and it's a great way to get a lovely sound.

It's a hybrid system with valve front end feeding transistor rear end, with plenty of benefits. You get oodles of power, good speaker control and yet wonderful ease of use, as well as a more atmospheric and spacious sound. So I thoroughly recommend this arrangement.

I suspect you can accommodate electrostatics. Go listen to Martin Logan Electromotions. They fit a small room easily and work well even close to a rear wall. It is best if rear output is damped a little with absorbent wall panels, but this is by no means crucial I find. For £2500 you get electrostatic treble and mid-band that leaves most else behind, providing you can acclimatise to the lack of box thrum,

and the airy no-box sound that results. Unrivalled detail and insight, plus razor sharp imaging and see-through clarity really are worth hearing. Only the small bass bins hold things back, but your Musical Fidelity AMS50 Class A power amplifier will do a good enough job here in helping them articulate bass, I suspect. **NK**

POINT SOURCE

I would appreciate some advice regarding new speakers to suit my room. I'm currently using Tannoy Turnberry SE speakers, in a 5m x 4m room. They fire down the 5m length, and due to room layout, I can only manage a foot or so between the rear of the speaker and the wall. My Turnberrys are well suited to this layout, but after having lived with them for three years, I would like something taller and slimmer with better WAF! Also, I find the Turnberrys quite forward in the upper mids, and the treble leaves a lot to be desired (as you no doubt already know). Power is provided by an EAR 890.

I prefer the benefits of point-source speakers, having previously owned several KEF models, including KEF Reference two/two's, which proved suitable using the bcd. I'm interested in the KEF reference 203/2, which I know you enjoyed, (I have the review), but I'm quite taken with the thought of the superb diamond tweeter in the Usher



The new stereo Beatles LP was half-speed mastered at Abbey Road by Miles Showell.

Mini Dancer 2.

Would they work in my room, and could I live with non point-source driver array.

I have also been looking at PMC speakers, and reviews on the PMC Twenty/26 seem very favourable, but again, I would be reverting to conventional driver arrangements.

Is there anything else I should consider? I don't mind buying used/ex-demo.

Kind regards,
Andrew Leo.

Hi Andrew. For focussed point-source loudspeakers you have, primarily, KEF and Tannoy to choose from. You may well be interested in the new-ish KEF Reference 3, although at £7500 they are not cheap. Don't ignore Tannoy's DC10 Ti either, or perhaps the smaller DC8 T, at around £4000 a pair.

Usher (Taiwan) have currently gone off our radar and have problems I believe; we are still trying to find out more here. Currently they are not answering our calls. But this



Icon Audio's PS3 valve phono preamp has enough gain and output to drive power amplifiers direct - and it has the necessary volume control too.

raises the issue of diamond tweeters and B&W come to mind. How about a new model 803 D3 with diamond tweeter? B&Ws are far from point sources, but many swear by them all the same – and you get the sheen of a diamond tweeter.

I'd strongly suggest you audition carefully at a dealer/s that stock these brands. **NK**

Hi Andrew. For something slimmer with more WAF (wife acceptance factor) I'd definitely recommend the KEF Reference 3s as well – especially if you are looking for a point-source loudspeaker.

However, from your comments about diamond tweeter-equipped models I get the feeling you are looking for a little more high-frequency definition. As such, I'd also consider some ribbon-equipped models. Just to throw one into the mix, consider Quadral's new Chromium Style 8 (we currently have a pair in for review and they are impressing us). They'll work well with your room and placement.

Personally, I'd advise not limiting yourself to point-source 'speakers but determining exactly what you are looking for from the combination of sound/looks and then listening to your shortlist at various dealers. **JM**

SPEAKER RESPONSE

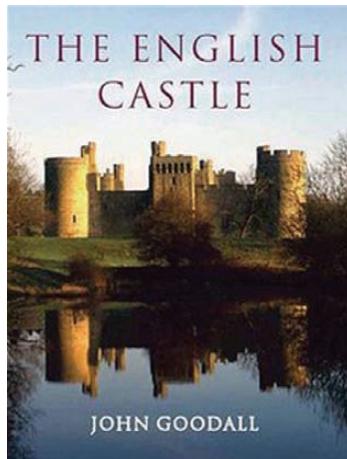
I am in the market for new speakers and over the last four months or so I have tried to hear a number of speakers reviewed in your publication. Here are my experiences.

Manufacturer 1. Contacted them via e-mail to establish where I might hear their speakers – their website was less then helpful in establishing "where to audition/buy". I subsequently received an e-mail from their Service Department – they thought I wanted spares... no, just to understand where I can audition them, I replied back. No further communication received.

Manufacturer 2. Advised that the UK was a "hostile" market for them. Advised best to buy direct via their website. Full refund available if I didn't like.

Manufacturer 3. Arranged for the speakers to be delivered to a local(ish) hi-fi shop. Great!

Manufacturer 4. Website advising "New website coming soon" with no other information available. Established identity of group company via their PDF brochure, found a number to call in the UK. Apparently no longer selling this particular brand of speakers in the UK



A majestic tome on the history of British castles. And a loudspeaker manufacturer difficult to contact, says Tim Jury.

despite recent review in *Hi-Fi World*, but it was suggested I check with their Sales Manager.

Perhaps mine is not a typical experience, but based on this it's hard to understand how the UK Hi-Fi market does any business.

Tim Jury

Thanks Tim. Now, that is interesting – and superficially depressing. I can add a little light though. Since you sent the names but requested we do not print, here then is a reader quiz: guess the manufacturer!

The Danish TC holding group of the first company was being taken over by an investment vehicle, run by German studio equipment manufacturer Behringer (clue), who are obviously of some size and financial muscle. Said UK loudspeaker manufacturer temporarily suffered a comms hiccup, even with us, and perhaps this affected their response to your request. Whatever, it sounds a somewhat un-together response, but they do have plenty of UK dealers to 'phone and I know they are a well meaning and responsible company.

The second response is a tad weird and this is a slightly esoteric small company, shall I say, possibly lacking a paddle (cryptic clue). UK dealers are unlikely to be "hostile" so much as completely swamped by loudspeaker brands wanting access to their showrooms. There are more loudspeakers and loudspeaker manufacturers than the market needs, much like the modern car market. This could be seen as a hostile environment, I suppose.

Either that or the company has/had poor relations with dealers, that can be influenced by dealer margins, poor service support (slow spares etc) and even personal relationships. Many MDs visit their dealers to talk to them, but not all MDs are diplomats, I well know!

The third company is German, very well run, and patient in trying to enter the UK market, which for most European companies is not worth the effort. We know them well and can vouch for their dedicated and thoroughly professional approach at all levels. Their Chromium loudspeakers (clue) are well worth hearing – completely superb.

The fourth company is a dear old UK name whose website is, as you say, being re-built, somewhat slowly it appears, but mighty constructions take time (clue). Their Chinese owner has a base in Huntingdon and they can be contacted and should respond in a useful way, but appears they have not in this instance. Not a lot I can say here other than if they lack UK dealers for the reasons I have already mentioned, then sales will not materialise. **NK**

Hi Tim. A fair point – and one that many of us can sympathise with when dealing with various businesses. It's



KEF Reference 3s - effectively point source loudspeakers. And the wife may like them.

worth bearing in mind, though, that most hi-fi manufacturers, whether in the UK or not, are not huge organisations and rely on dealers and distributors to market their products.

It's also worth bearing in mind that while e-mails can be a convenient mode of communication it always takes someone at the other end to answer them – and that can be a time consuming business if they are swamped with oft-trivial queries.

JM

MARVELLOUS MICHELL

Andrew from Doug Brady HiFi came over this Saturday and delivered and set up a Michell Orbe turntable. Side by side with the Focus One it makes the Focus look old and frail, something I never thought I'd say. I had the Orbe in full cover form in clear acrylic with silver chassis and trim as the black was a bit too Darth Vader for me. I love the look of it with the silver SME IV and I'm using an Ortofon 2M Black. I chose the full cover version because dust is the enemy of clear sound from vinyl and I didn't want to spend all that money on a spyder version only to see it covered in dust after a few days.

So, is the sound what I expected? Well, no it isn't. After the rush of seeing it set up and trying a few different cartridges I initially thought that I hadn't got much improvement for my money. I'd expected earthquake bass and the improvement was OK but not earthquake.

I'd expected massive impact, whereas it was quite restrained. An object lesson that you put a component in with the rest of your system, not the one in the shop, maybe.

I sat there sipping a cup of tea absorbing these feelings teetering on the disappointed...and then a strange thing happened. I'd picked an old LP of mine 'The Phase 4 World of Thrillers - Decca SPA 150' which I'd bought when I was ten because it had the original Avengers theme tune on it. It has a wide ranging collection of film and TV themes which would give any stylus a run for its money. Included on the playlist is an overture version of 'On the Waterfront'. This has a loud percussive sequence in it which has always reminded me of someone thrashing around on the timpanies like a drowning octopus.

However, here hanging in the air in front of me were two clearly rendered percussionists playing separate percussion sets. The solidity and attack of each beat was charged with the resonance of the drum and had real weight and character. Mmm! – that was rather a revelation.



"All of us who love vinyl owe John Michell a debt of gratitude", says Rowland Cook. Here is their Orbe turntable.

So it went on. Greensleeves from the LP 'The Music of England - Polydor 2838 268 super' hung in the air like early morning mist with a real sensation of atmospheric tension. Ray Charles live rendition of 'Makin'Whoopie' from the LP 'The legend Lives - Ray Charles TV LP' was a delight; the three way interplay between his singing, the piano and the audience reaction was palpably like being there.

My friend Adrian came over with a few of his records. 'Bad Moon Rising' by Creedence Clearwater Revival had the whole band distinctly rendered in the soundstage rocking along with the distinctive guitar riff. Fogarty's voice clear as crystal over the top.

Dave Brubeck 'Take 5' from Time

Out was rock solid on the piano motif and all the other instruments coming and going in perfect synch and each clearly rendered.

'After Hours' from the Swing Out Sister LP 'It's better to Travel' demonstrated a real grip as the opening meditative chordal half of the song gave way to the walking bass closing half.

On Miles Davies 'Kind of Blue' I could hear the different tonal textures he gave to his notes, with bypass breathing and humming.

It dawned on me that I hadn't so much bought a new record turntable as found a new record collection and the cost of the deck seemed eminently reasonable when viewed like that. I guess things really do take a while to



Garrard 401 with Martin Bastin modifications, used by Editor Noel Keywood.

play in after all!

Then I noticed something completely unexpected. Most of the pops and crackles had disappeared. Some of my LPs are old ones I inherited from my parents and I'd got used to the rustles, pops and crackles over the years. Here I was listening to music playing out of an inky blackness, the odd pop or crackle being noticeable because of their general absence.

I've always used a brush and an anti static pistol, but the 2M Black came with a stylus cleaner and on Alan's advice I am cleaning the stylus between each play. It seems to work and I recommend doing it to all record heads.

I think all of us who love vinyl owe John Michell a debt of gratitude. Not only is the company he founded still going strong and producing exquisitely engineered turntables but he also made a series of innovative design developments that have been copied by nearly all the other turntable manufacturers. As an innovator you don't get higher praise than that and if I get to heaven I'll look forward to shaking his hand.

regards

Rowland Cook

GARRARD UPGRADE

I have a Garrard 401 turntable mounted on a homemade, laminated plywood, sand-filled plinth. It sits on eight large Sorbothane feet. The turntable has been completely fettled by Dr. Martin Bastin and includes his Low Friction bearing, his new idler wheel, improved wiring and his Power Supply with screened cables. I use a Slate Audio glass platter mat and a weighted record clamp.

On the Garrard sits an Origin Live MII Silver tone arm with an SME fluid damper fitted and a Goldring 1042 cartridge.

The rest of the system comprises a Naim NAC72 preamp with Hi-Cap power supply, feeding a Naim IXO crossover into two Naim 140 power amps. I use Naim NACA5 speaker cable into a pair of Wilmslow Audio V2 speakers. They sit on damped marble stands which sit on three metal cones on the concrete floor of the flat.

Added definition (to the bass) comes from a pair of Max Townsend Super Tweeters. Added definition (to the treble) comes from an REL Stadium M11 sub-bass.

CD player is a Cyrus 8SE with a PSX-R power supply linked to the preamp using MIT's AVt1 leads.

All except the Dr. Bastin products, the speakers, the headphones, record



"RedBeard super bearing from Northwest Audio would make better economic sense?" for my Garrard 401 asks Ray Spink.

cleaning machines and the cassette deck have been purchased second hand.

I was wondering how best to upgrade the record deck. Would money be best spent on a better Origin Live arm? If so, which arm and which cartridge would you recommend?

My own thoughts were that the RedBeard super bearing from Northwest Audio reviewed very favourably by Adam Smith in February 2012 would make better economic sense (£600). After making enquiries, Northwest Audio replied that they need to have a good few orders to warrant the cost of manufacture. Please publish this letter so that others may be reminded or introduced to the super bearing idea of an up-grade and enough orders are placed.

To up-grade the arm and cartridge would be more expensive methinks:

circa £500 for a M.C. cartridge to see a significantly betterment and circa £1000 for a better arm from Origin Live. The RedBeard bearing seem somewhat of a bargain by comparison.

I could afford both upgrades but the bearing seems a more fundamental improvement. I want to keep the expenditure balanced. A high Bang for Buck ratio!

Please advise.

**Ray Spink
Nottingham**

Hi Ray. As good as the Goldring 1042 moving magnet (MM) cartridge is, it's not in keeping with the rest of your system. You must move up to a moving coil (MC) cartridge.

Dr Martin Bastin's improvements distinguish my Garrard 401 and I am happy with them; a new bearing may well alter the sound, perhaps for the better, but you are way off song with an MM in your revealing system.

Look at low cost but 'proper' budget MCs like those from Audio Technica or Benz Micro, in particular. The world is your oyster – enjoy it!

NK

CLEANER VIEW

As a reader of Hi Fi World, I strongly appreciate your comments on analog products. But in the new January issue Paul Rigby made a mistake about vinyl cleaning.

As a chemist, formulator and producer of an ethanol-containing cleaner (which is very successful on the European continent), I will explain why you are mistaken in concluding that such a product necessarily damages the vinyl used in LP production.

The facts of the matter are: the base material, untreated vinyl polymer,



The chemicals you use for cleaning an LP are important, says Lourens Ouweltjes.



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is a brittle product. To make the vinyl flexible and suitable for record production, so-called softeners are added to the vinyl granules. These softeners are indeed soluble in propanol and to a lesser extent in ethanol.

Prolonged use of a cleaner with 80% or more ethanol may lead to some of the softeners being dissolved, with increased brittleness of the vinyl as a result. But with cleaners containing less than 45% ethanol the situation is totally different. At these lower concentrations all of the ethanol molecules interact with water molecules by polar bonding and consequently have no solubilising effect on the softeners at all!

As we are not in the business of supplying a product that may in any way have an adverse effect on records we have exhaustively tested our cleaner with long exposure times (24 hours) at room temperature – with no change in brittleness being the result. Furthermore countless thousands of LPs over many years have been cleaned by our many customers without any complaints at all. It is also a fact that our competitors have never succeeded to produce a cleaner as effective as ours up to now.

We have, of course, also tested the L'art du Son product against our own. Two things became clear: the effectiveness in actually cleaning a record is lower. After mixing with de-mineralized water some deposit is formed after some time. This may lead to some sludge formation on the record after use.

We would like to think that your comments on this subject were not commercially motivated. So keep on listening to fine cleaned records, Takumi cartridges and the like!

I hope this clarifies the record cleaning process.

Kind regards

Lourens Ouweltjes

QS Audio
Krommenie,
The Netherlands

NEW PLANAR

Just thought I should provide a little update with regard to the Rega Planar 3 turntable and its similarly motored stable-mates! These turntables turn up at my workshop occasionally with dire thoughts from the customer saying "it stopped going round" or "it needs a new motor" or "it goes forwards then backwards" or "it just makes a drone noise".

Now, if you investigate the problem, rather than paying £56 plus for a new motor, the first thing to do is to change the field winding coupling capacitor on



If your Rega Planar 3 "goes forwards then backwards", "the first thing to do is to change the field winding coupling capacitor" says Dave Tutt.

the printed circuit board. It's a $0.22\mu F$ X2 class capacitor and one of these is a suitable replacement: <http://cpc.farnell.com/vishay-bc-components/bfc233820224/capacitor-class-x2-220nf-275vac/dp/CA06027>. This part at less than £1 makes the turntable return to normality and can be fitted yourself if you have the soldering skills!

I was very pleased to see your item about the Raspberry Pi computer in the November issue. I have done several media things with the Pi which have all ended up with customers who were amazed by what it could do. The new 7 inch touch screen, again available from CPC Farnell, looks a great idea in creating something to compete with media players at £500 or more.

When I get the time I will be making another unit with the add in ADC-DAC board and the new touch screen! <http://cpc.farnell.com/pi-display7-ip>. I'll try to find out myself about that recording issue! I'm sure there is a reason! I am also working with a company developing hardware and software solutions using the Pi for commercial usage which would suggest its capabilities are far beyond its size and price suggest.

The McIntosh power amplifier with its transformer coupling has to be a great cross-over product. I have always loved valve amps from the response tweaked guitar amp styles to the 1960's PA amps using EL34s to the likes of the Leak and Quad amps of the same period, even though I now prefer the transistor sound for general listening. One idea I have always wanted to follow up is the transformer coupled transistor amp which I think McIntosh have somewhat beaten me to the build!

However, there could be a design project here to create something rather more financially possible from stock

components and perhaps a more domestically acceptable power output, say 40 Watts rather than 250?

On the power amp front I get to see many slave amps, as they used to be called in PA systems, and there are some cracking amps out there that are far better than their muscle design would have you believe. Yes, there are some cheap, rack mount amps out there that offer Watts for peanuts, but there are also some brilliantly designed and built amps which are wasted in PA and disco use! Perhaps I should build a good and bad list of those that appear in my workshop, usually damaged by bad driving more than anything else, which would give an idea to those interested in these things!

Regards

Dave Tutt

www.tutt-technology.co.uk

07759105932

Chatham

Kent ME5 0AU

Hi Dave. Thanks for your DIY tips. There's nothing like getting under the bonnet! As Mike Creek pointed out to us, early transistor amplifiers used output transformers to protect the output transistors from short circuits and other potential causes of failure.

However, McIntosh use an auto-transformer to swing more volts but less current, reducing distortion. They also say their transformer coupled power amplifiers are fully balanced throughout. Whatever it is they are doing in these unusual amplifiers, it certainly is effective – they sound wonderful. However, they do not sound like valve amplifiers at all, more like super-charged transistor amplifiers – forensically clean and fast, with enormous bass grip and punch.

NK

NuLife for NuForce

Two years ago NuForce was rescued by an unlikely hero. Martin Pipe tries a clutch of the resulting products.



Until now, I had only ever associated Optoma with the DLP projectors that it was my task to review for a home AV magazine. But, it seems, the Taiwanese firm has an audio facet too. It's known as NuForce, a name that's perhaps more suggestive of computer gaming peripherals than the reproduction of music. NuForce started life in California a decade ago but was acquired by Optoma in 2014 following its bankruptcy. At that time,

NuForce's range included nearly 50 products. This was pared down to 15 by Optoma but new models are being readied for introduction.

NuForce specialises in making small but fine-sounding products and its first was a solid-state monoblock power amplifier built around a proprietary Class D switching technology. Its spec was impressive. Amongst other things, low output impedance facilitated a claimed damping-factor of 4,000. This ensured

good speaker control, manifesting itself as tight and clean bass. These 'Reference' models sold for a very reasonable \$2,500 a pair and generated much interest among US audiophiles at the time.

Now we have the ST120, a stereo amplifier that sells for \$1300 in the US; over here, you can expect to pay £650. The ST120 couples a rather more conventional Class D amp with a conventional linear power supply. It's thus somewhat heavier (3.5kg) than its diminutive

size suggests, thanks to an enormous toroidal mains transformer. I was told by NuForce engineer Casey Ng that such an arrangement provides the best performance at the target price-point; a dual-rail switch-mode power supply of the sort required by the STA120 would be much more complicated and, if not properly-implemented (i.e. expensive!), could compromise performance.

Also selling for £650 is the matching DAC80 DAC/preamp, that will handle coaxial (two inputs),

to hook up that phono stage. This is because the DAC80 lacks an analogue input...

It took a while to figure out how to switch between the inputs of the DAC80. The manual is erroneous, and the review unit wasn't supplied with the remote that would normally be used for this purpose. Basically, when the volume control is given a long press it cycles to the next input – the currently-selected one shown by an LED that ingeniously shines through perforations in the front panel to

"the Chemical Brothers track illustrates the NuForce's commendable grasp of rhythm. It's fast, focused and incisive"

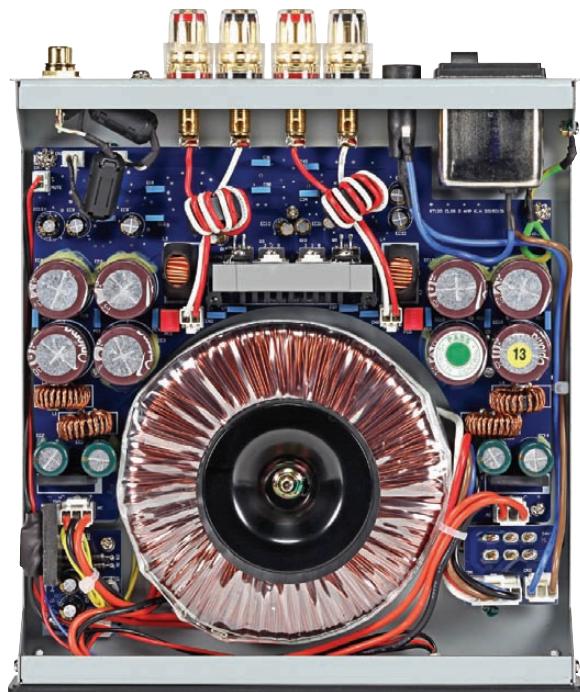
optical or asynchronous USB sources (generally a PC or Mac), supports PCM up to 24-bit/192kHz and features a volume control. They link together via standard phono sockets; no XLRs or balanced feeds here!

Vinyl lovers, beware: if you buy a DAC80 and STA120, prepare to be flummoxed when time comes

form the appropriate character.

Holding down the volume control places the unit in standby. It may have the end stops of an analogue potentiometer but control over volume is implemented in the digital domain.

When switching between active inputs, you get a short burst of



The STA120's interior is dominated by an enormous toroidal mains transformer. On either side are quartets of smoothing capacitors – for each split power-amplifier supply rail – that have been made specifically for Optoma. Thanks to the efficiency of Class D amplification, the heatsink can be small – as can be seen here. Over many hours of use, the STA120 casing was never more than slightly warm.



Inside the DAC80 audiophile design is very much in evidence. The USB sub-system occupies a plug-in board that can be seen in the top left of the picture. The analogue output op-amps to its right are socketed for ease of substitution (subject to guarantee reservations!). Energising all this circuitry is a linear power supply employing banks of electrolytic capacitors to banish ripple and hum.

distortion. Thankfully, it's not loud enough to be destructive – or, for that matter, particularly annoying – but on first acquaintance it's disconcerting to say the least. I asked Casey Ng for an explanation. I was told that the "DAC80 has a unique digital FIFO ('First In, First Out' buffer) to completely eliminate the jitter from a digital audio data stream", a consequence of which is "that as you abruptly switch input", the audio bytes are truncated and patched – resulting in noise. Why didn't the NuForce team implement some kind of audio mute (for example a relay that only passes the output to the rear-panel sockets after a short preset delay, whenever the input selector is used)?

PERFORMANCE

Listening involved a pair of Quadral Aurum Wotan VIII speakers and, for the most part, an Acer Revo Windows 8.1 PC loaded with the Foobar2000 player and an extensive range of FLACed music. Its USB audio output was set to match the sampling-rate and resolution of the music files being played to avoid any unnecessary conversion. The DAC80's optical input was fed with the hitherto-



Everything you could want for - except maybe an analogue input for the DAC80 DAC/preamp (middle unit), balanced audio connections and 5-volt power-supply output for the BTR100 Bluetooth receiver (top unit). Slide switches allow the linear power supplies of the STA120 power amp and DAC80 to be switched between 100-115V and 220-240V. Great news for those with emigration plans...

unmentioned third part of our review package, the £60 BTR100 Bluetooth adaptor. This tiny apt-X supporting device has an analogue output, which wasn't used here. The BTR100 doesn't match the styling of the DAC80 and STA120 but is easy to use and fulfils its purpose admirably. When set up properly (i.e. source volume carefully-adjusted) it's capable of a commendably-engaging performance with a variety of different music held, in my case, on a Samsung smartphone

as losslessly-encoded files.

The system was able to take in its stride the tonal variety and sheer enormity of Britten's 'War Requiem'. Bells and brass instruments are given attack, bite and precision while the brooding strings retain their richness and colour. Choirs are presented with an appropriate sense of scale, their place in the soundstage complementing the other forces at work. The baritone of the 'Dies irae' is presented with authority and stature

but the muscular percussion doesn't perhaps get the depth it deserves.

Sure, it's tightly-portrayed and remarkably well-defined – but there's a lack of the absolute bass extension that's expected here.

Such character was also evident with the plunging synth bassline that precedes the male choir of Thomas Dolby's 'Cloudburst on Shingle Street' ('The Golden Age of Wireless' CD). Ironically, with modern electronic music (for example, The Chemical Brothers' 'Wide Open') it wasn't quite so evident. This is because such recordings tend to emphasise the low end. After switching to Arcam's muscular A49 integrated – admittedly a much pricier amp – this shortcoming was put into perspective. But The Chemical Brothers track illustrates the NuForce's commendable grasp of rhythm. It's fast, focused and incisive.

CONCLUSION

In terms of music-making ability, the DAC80/STA120 combination shows much promise – all in a couple of boxes that take up so little room! Maybe that lack of low-end slam can be forgiven; after all, if you have little space for amps then you're unlikely to find room for the kinds of enormous speaker box that will reveal such minor deficiencies.

MEASURED PERFORMANCE

The NuForce DAC80 produced a high 4.2V out, sufficient to drive any power amplifier; there was no headphone or XLR to measure.

DAC distortion at full level (0dB) measured 0.0009% and at -60dB an again low 0.027% with 24bit digital. EIAJ Dynamic Range (24bit) was high at 118dB, and also good with CD at 103dB. So the NuForce DAC80 works well with hi-res, although it isn't class leading. Around 120dB or more is now becoming common.

Frequency response with 192kHz sample rate digital reached 27kHz (-1dB) with an upper limit of 96kHz, the half sample rate frequency. Our analysis shows a slow roll off above 20kHz with 192kHz and 96kHz sample rate digital but 44.1kHz (CD) measured flat to 21kHz. The optical input worked to 192kHz where many top out at 96kHz.

The NuForce DAC80 measured well, if not quite up with the best.

The STA120 Class D power amplifier produced 120 Watts into 8 Ohms and 210 Watts into 4 Ohms. With a very high damping factor of 68 it will sound dry and

well controlled, yet is massively powerful for such a small package that runs cool.

Distortion was very low at all frequencies – and most importantly for Class D at low levels, where they commonly produce switching mush. Distortion measured just 0.02% at 10kHz, 1 Watt, rising to 0.1% at 25 Watts and 0.3% at full output, a good result for Class D, if not up to A/B standards.

Frequency response was flat to 20kHz and above into a 6 Ohm load, with variance above 20kHz into other loads, caused by the mush-removal low pass output network Class Ds need.

Both DAC80 preamp and STA120 power amplifier measured well. NK

DAC80

Frequency response (-1dB)

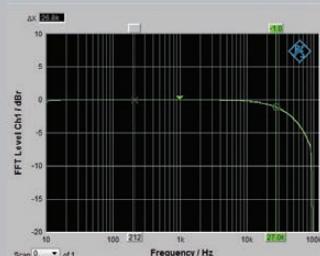
CD	4Hz-27kHz
Distortion	24bit
0dB	0.0009%
-60dB	0.03%
Separation (1kHz)	97dB
Noise (IEC A)	-116dB
Dynamic range	118dB
Output	4.2V

STA120

Power (8 Ohms)	120 Watts
Frequency response	2Hz-20kHz

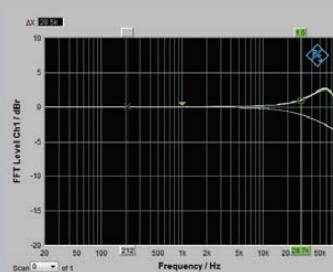
NUFORCE DAC80

FREQUENCY RESPONSE



NUFORCE STA120

FREQUENCY RESPONSE



NUFORCE
DAC80 £650
STA120 £650
BTR100 £60



EXCELLENT - extremely capable

VERDICT

A compact combination of DAC/amplifier and Bluetooth receiver that provides great sound at a reasonable price.

FOR

- precision, cleanliness,
- rhythmic flow, neutrality
- neat and compact
- energy-efficient

AGAINST

- burst of distortion audible when switching between inputs
- no analogue input
- lack of absolute bass depth

NuForce
www.optoma.co.uk



HI-FI WORLD
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Stereo 845pp

"King of Triodes" ST845pp 50wpch £5,995 Worlds first 845 PP integrated amplifier

HI-FI WORLD
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Wire Free

Philips Fidelio M2BT headphones offer Bluetooth connectivity for wire-free convenience. Noel Keywood tries them out.

Fed up with cable tangles? Or just cables themselves? Bluetooth is a short range radio link designed to eliminate them and Philips use it on their M2BT headphones I'm reviewing here, to provide cable free linkage to mobile phones and portable players – a nice idea.

I was surprised at just how simple and effective Philips have made it all. Putting Bluetooth on headphones raises some awkward issues: a Bluetooth radio receiver, mini power amplifier and battery power supply must all be shoehorned in, with little obvious weight increase – not easy. Philips manage it however. I was expecting a pair of seriously heavy 'phones, up to the 460gms or so of Audeze for example, but the M2BTs weighed a light 190gms on our scales. They must first be charged (3hrs) from a mobile phone charger or computer USB port; a charger is not supplied, but a suitable USB lead is. Philips also supply a conventional 1m flexy signal cable terminated both ends with 3.5mm stereo jacks in case the battery runs out.

On the 'phones themselves there's a microphone for taking phone calls, a Bluetooth pairing switch and a volume control. I found pairing easy and quick: just press the button until blue and white LEDs flash then my Astell&Kern AK120 player flashed up Philips M2 almost immediately and I was away.

The M2BTs are fairly compact, although not pocketable, even though both earpieces swivel flat. They'd fit a small bag however, without difficulty. The earpieces have soft memory foam pads that fit over the ears, not around them. Headband pressure was well judged, making them comfortable. They have closed backs

and don't emit much sound, even though the backs look as if they are an open grille.

Bluetooth uses a unique compression algorithm to give near-CD quality. You do not get the full benefit of 24bit resolution that hi-res audio has to offer and there was less differentiation in quality between tracks when using the M2KBTs against my Oppo PM-1s. Having said that, Bluetooth connection usually gives enjoyable results and I've never taken offence at it; there are no hidden nasties within the system.

Unfortunately, although these 'phones connected to both my AK120 portable hi-res player, and a Samsung mobile phone, behaviour was erratic. With the AK120, the phones could not be switched off then back on and reconnect, but with the Samsung they could – but then both often crashed. With a new iPhone 6S all worked well; the M2BTs could be switched off and on without problem. Bluetooth is usually more stable and assured than this. The press-button selector system with beeps made sense but was awkward in practice; our review 'phones were a struggle to use.

Range was immense – around



50ft but this will depend upon the transmitter as well as the 'phones.

Once up and running sound quality was very good. The M2BTs had strong bass but it was just shy of being too strong. Kettle drums providing the background to 'Mars' from Holst's 'The Planets' had thunderous presence, conveying the full weight of the orchestra. I'd guess Philips have been aware of the Beats (heavy) bass phenomenon but they haven't sought to mimic it here, so much as keep it in sight; the M2BTs are little heavier than their more svelte stablemates, the X-2s. And like the X-2s treble from the M2BTs was impressively smooth and easy, making for a class presentation.

In all, the M2BTs offer a classy sound and connection without wires. Erratic connectivity upon switch on after pairing was a problem for us, if not with all devices. A mixed result then.

PHILIPS FIDELIO M2BT £220



GOOD - worth auditioning

VALUE - keenly priced

VERDICT

Good sound quality, and no leads, but erratic Bluetooth connection

FOR

- no wires
- well balanced sound
- light

AGAINST

- erratic pairing
- difficult to use

Philips

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Quad lives!

Martin Pipe concludes his story of quadraphonic audio with an examination of how its legions of fans across the globe are keeping the format alive.

Throughout the eighties and nineties, quadraphonic sound was regarded as a market-failing symbol of 1970s music-industry excess.

Then, with no great irony, multichannel audio was once again pitched at UK consumers courtesy of 'home-cinema'. Programme sources of broadcast quality were now available and two-channel audio sources could convey the matrixed Dolby Stereo surround-sound movie soundtrack.

During the CD 'gold-rush', it was discovered that the transfers of some quad-era albums were mastered from matrix-encoded tapes (listed here: <http://bit.ly/1MaFy4X>). They could be decoded by existing quad gear but gave disappointing results with home-cinema surround-audio systems.

As home-cinema decoders and receivers became more advanced, they included ever more 'digital soundfield processing' (DSP) modes. Some made a better stab of 1970s quad matrix decoding than others, but no manufacturers considered a 'genuine' SQ or QS mode worth



The Surround Master from Australian firm Involve Audio. Using a complex mix of digital and analogue techniques, it's the first product in decades with the ability to recover four channels from matrix-encoded quad sources – such as LPs, and CDs mastered from old encoded tapes. Note that you'll need the alternative 'SQ' model for best results from the most popular quad LP format. Both versions are very effective at what they do.

bothering with.

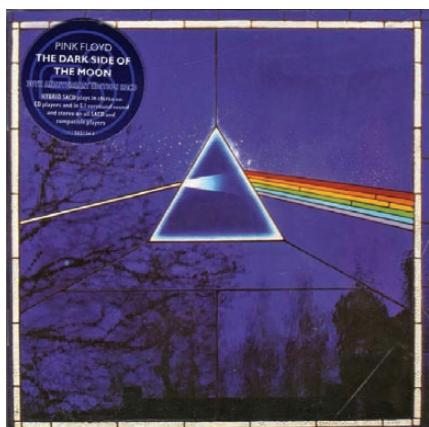
That's hardly surprising. Modern gear is built around films and Dolby Stereo; music tended to be of secondary importance.

Technology was, however, to shift the balance in music's favour. Cinema multichannel sound was going discrete digital and the domestic scene followed suit. By the late 1990s, we had compatible decoders in the home – first for Dolby Digital and then its higher bit rate competitor DTS. As originally-launched, these lossily-compressed 16-bit '5.1' formats gave you up to six discrete surround channels. They could thus be used to distribute quadraphonic sound.

The first digital discrete format to repurpose this growing (re)acceptance of quad for the

enjoyment of music was 1997's DTS CD. This used the standard Red Book CD as a 'carrier' for DTS compressed multichannel audio sampled at CD's 44.1kHz rather than the 48kHz of movies. But although a regular CD playback system would accept a DTS CD, you would hear either unpleasant noise or silence. What you had to do was take the digital feed from your CD player and connect it to a DTS decoder or one of the new breed of AV receivers that built in the decoder.

Among DTS CD releases were Steely Dan's 'Gaucho', Sheryl Crow's 'Globe Sessions' and Sting's 'Nothing like the Sun'. These came after quad's demise and so they contained newly-commissioned surround mixes. But also offered on DTS CD were albums like Santana's 'Abraxas',



Pink Floyd's '30th Anniversary' Dark Side of the Moon was the best-selling SACD of all time. Arguably, the release of this SACD helped to reinvigorate interest in quad.

Wings' 'Band on the Run', and The Moody Blues' 'Seventh Sojourn' – all of which were sold in quad form back in the 1970s. And on those discs was the very same quad mix, sourced from four-channel tapes and now offered in discrete form of hitherto unforeseen potential!

DTS CD was hardly a mainstream format but the enormously-successful DVD-Video format that immediately followed supported discrete multichannel audio from the outset. In addition to countless movies, many concerts and albums were released on DVD Video. Some contained a freshly-minted 24-bit, 96kHz DTS multichannel soundtrack that recent AV gear could understand. But for music, two new



Quad recording also comes in small (and affordable) packages. This is the pocket-sized Zoom H2n. Thanks to a complement of five microphones, it offers 'regular' stereo, Mid-Side stereo or genuine quad operation. The output is two 16- or 24-bit stereo WAV files, which can be edited in Audacity and then passed to an encoder.

competing hi-res formats were seen as the way to go: SACD (Super Audio CD) and DVD-A.

Following their launch, we began to see new multichannel music released on both, as well as 5.1 remixes of titles like Pink Floyd's 'Dark Side of the Moon'.

Neither format came to much as a mass-market proposition – despite 5.1 'home cinema in a box' systems and the universal disc player.

By the end of the 'noughties', powerful computers and desktop audio production tools were to give old quadraphonics and formats like DVD-A and DTS CD a new lease of life. People discovered you could use audio editing software like Adobe Audition to 'decode' SQ and QS matrix formats by applying the appropriate processing tricks. They shared 'scripts' that would allow anyone with quad LPs – and the wherewithal to digitise them – to retrieve the four channels.

A good starting point here is the QuadraphonicQuad forum – see <http://bit.ly/1RPBxq8> (SQ) and <http://bit.ly/1k8yizH> (QS). A stereo WAV file containing your matrixed quad album can then be processed with the script and you get four WAV files containing front and rear channels.

These WAV files can then be passed to a DTS encoder operating to create a DTS WAV file that can be burnt to CD or shared online as an ISO 'image' file. After downloading, this image can be copied to disc with any computer equipped with a CD/DVD 'burner' and played with compatible AV gear.

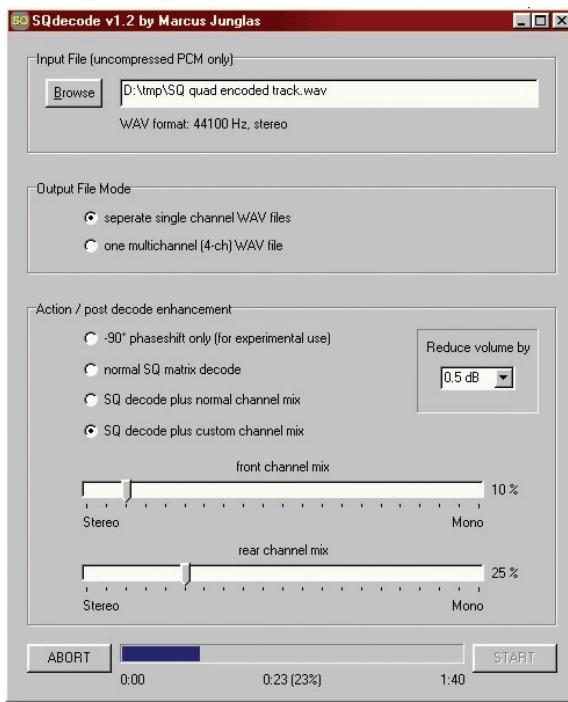
Discrete formats like CD-4, four-track reels and Q8 carts pose little challenge either, thanks to affordable four-channel soundcards pitched at home recordists and musicians. Through such means, the half-inch four-track master of Alan Parsons' 'Dark Side of the Moon' quad mix was 'liberated' and shared online.

There is the question of legality when it comes to file-sharing. Strictly speaking, you're breaking the law. But those who upload to file-sharing sites claim that as the record companies have no interest in releasing quad material, then what they're doing is a 'service' for fans of the music. And there's now the first new hardware decoder for several decades in the shape of the Surround Master, from Australian firm Involve Audio.

So quadraphonic sound may have been cruelly dismissed by audio historians as a gimmicky fad but thanks to its legions of supporters around the world it refuses to die!



Four-channel soundcards also enable discrete quad sources to be digitised and converted into a form that's compatible with modern playback gear. This unit is an Akai EIEPro 24-bit capable unit with a USB computer interface. Here, it's shown with a quadraphonic microphone of my own design.



Accurate decoding of matrixed quad by computer is also possible – could anyone have envisaged this back in '73? The usual approach is to prepare a decoding 'script' for audio editing software like Adobe Audition. There are also 'stand-alone' approaches – usually free downloads – like this one. Specify the input file (typically a digitised SQ LP), apply the desired settings and hit 'start'. The result is four WAV files that can be passed to the encoding or authoring program of your choice.

For those seeking true excellence from their audio system



Clockwise from top left: Edge, German Physiks, Clearaudio, GutWire

Acustica Applicata	DS Audio	German Physiks	Lyra
AudioDeskSysteme	Edge Electronics	Gutwire Cables	Norma Audio Electronics
Avalon Acoustics	ELAC	Harmonic Resolution Systems	Nottingham Analogue
Benz-Micro	Finite Elemente	Jeff Rowland Design	ProAc
Clearaudio	Furutech	Lawrence Audio	SME Limited
			Transfiguration

Glorious App-ening

Martin Pipe sings the praises of Cambridge's potent CXN streamer

Last year, I clapped my ears on the Cambridge Stream Magic 6 v2 – a versatile digital source component that combined the roles of network streamer, Spotify client, DAC and Internet radio tuner. It has since been supplanted by the CXN, a similarly-priced unit that spearheads Cambridge's elegantly-styled CX series – claimed, in the firm's own words, to combine "effortless compatibility with your digital music with beautiful design".

And although the common heritage of the two is evident – buttons ranged around the information screen, a USB port for 'local' media playback and a large multifunction knob – there are some obvious physical differences between

the Stream Magic 6 v2 and the CXN. Gone is the button that gives you control over the digital filtering; with the CXN you're stuck with the characteristic that Cambridge's engineering team plumped for.

Offset against this omission is a major revision of the front panel screen. It's in full colour and will display radio station logos, album artwork and so on.

In terms of basic functionality, little has changed; no bad thing! In addition to Internet radio, you get the ability to stream (and, via USB, play locally) a wide range of audio files ranging from MP3 to 192/24-bit FLAC and convert external digital sources to analogue. One of these could be Cambridge's matching CXC, a CD transport with no analogue

capability.

The only significant additions are compatibility with AirPlay – something that should please Apple devotees – and streaming DSD64 compatibility. The latter, added via a firmware update during the review period, addresses a concern of some would-be buyers. Its inclusion is interesting, considering that the DACs employed – as in the Stream Magic 6 v2, each stereo channel is served by a Wolfson WM8740 operating in dual-differential mode – only accept PCM data and cannot, unlike some other chips, operate natively in DSP mode. In other words, conversion between DSD and PCM has to take place inside the CXN.

This is fulfilled within the CXN's Analog Devices Sharc 32-



bit DSP chip – using code written by the Cambridge team. Other features they worked on during the CXN development stage included Cambridge's proprietary ATF2 upsampling technology and the Zander audio streaming module. We should not forget the volume control, which is active when the unit's 'digital preamp' feature is engaged. This implemented digitally, and although there's theoretical loss of resolution at low levels it worked very well if my experiences are anything to go by.

I tried turning it down, compensating for the change in level by adjusting my amplifier's volume control and I got none of the expected 'roughness'. But then again, the work is being done at a resolution of at least 24 bits. Owners of power amps and active speakers can couple the CXN with confidence. Another advantage of digital control is its freedom from future 'pot crackle'.

The CXN is easy enough to use, after getting over an initial misconception that its screen was a 'touch' variant! It's easy to assign specific radio stations as 'presets', but it's a shame you can't do the same with networked folders. There are only eight presets, which can be accessed directly via buttons on the remote.

Also worth mentioning is the excellent 'Connect' app, which is a much speedier proposition than the front panel when it comes to selecting new radio stations or networked music for playback. For the latter, you're given a folder view. Swiping through them to find what you're after – tracks can, out of interest, be added to a playback 'queue' – is a doddle! Given that the app makes the front panel redundant, I can't help wondering if Cambridge could make a cheaper 'black box' version.

In connectivity terms, the CXN is similar to the Stream Magic 6 v2. You get optical and coaxial digital inputs, plus an asynchronous Type B USB port (with 'ground lift' facility, which may be useful in the event of an audible hum). This will enable the CXN to be used as a USB Audio 'Class 2' computer DAC with support for DSD64 and PCM all the



Cambridge also takes pride in the internal layouts of its products. The CXN's analogue electronics – note the two Wolfson DAC chips, high-quality capacitors and muting relays – is at the opposite end of the enclosure to the switch-mode power supply. The green sub-board is the Zander streaming module.

way to 24/192. To take full advantage of the USB interface, you may need to change (via a menu) from the default 'lowest common denominator' driverless 'Class 1' mode. Windows drivers for Class 2 mode are available from the Cambridge website.

There are also rear (and front) panel USB ports for playing local media and a third port for a Wi-Fi dongle that provides an alternative to wired Ethernet. The supplied unit is 2.4GHz but I hope that Cambridge introduces a model for the less-

held on smartphones.

But then Cambridge offers a superior solution. Use the Connect app (which, by the way, is also compatible with the Stream Magic 6 v2) and you can 'push' music to the CXN app via a Wi-fi connection. Simply select the relevant folder on your device, and click on the tracks you want. The files are streamed 'as-is', and so there's no needless music-mangling.

OK, that's how you can get music into the player. In terms of

"The CXN is incredibly versatile. It was able to play every track I threw at it and convey their sound quality accurately"

crowded 5GHz band. On the subject of wireless connectivity, I should point out that Bluetooth is a £100 option. This 'BT100' device plugs into one of the USB ports.

The reliance on extra hardware is unexpected, considering that lesser units provide this feature as 'standard'. (Re)compressing your music so it can be squeezed down a Bluetooth link isn't good news for sound but it works well in practice, and countless music collections are

outputs, you get balanced XLRs and unbalanced phono for analogue – optical and coaxial outputs are provided too. No headphone socket, though.

SOUND QUALITY

For most of the listening, I coupled the CXN to a Benchmark DAC2 HGC DAC/preamp/headphone amp (via analogue), AHB2 power amp and SMS1 speakers. The first thing I tried was radio. Radio 4, that only gets a

128kbps MP3 stream, demonstrated a neutral tonal balance. The speech programmes that constitute the bulk of its output are presented naturally with no untoward sibilance or throatiness.

Furthermore the only artifacting, glitches and hiss that posed an audible problem were from the BBC's own outside-broadcast links!

6 Music, also carried at 128kbps MP3, performed better than expected with a surprisingly-convincing musicality – especially with the live session recordings that the broadcaster does so well. Compared to album tracks, though, I noted an increase in congestion. Hardly unexpected – and not the CXN's fault.

That it makes these low-bitrate services so listenable is itself a remarkable accomplishment! The CXN's streaming potential is perhaps better realised via Radio 3's 320kbps stream – which is available here. Again, you get an engaging and full-bodied performance.

Then there's the atmosphere. The ambient drone of A Winged Victory for the Sullen's eponymous album fared particularly well here; you're enveloped within the music. Piano attack and decay convince, and on occasions I could pick out individual contributions within the strings.

Still on the subject of strings, I derived much pleasure indulging



The neat rear panel of the CXN, with all connections arranged into logical groups. Cambridge's painstaking attention to detail extends to the 'upside-down' labelling – which appears the correct way up when you're peering down with a bunch of cables to connect!

myself in parts of ELO's back catalogue – in particular 'Out of the Blue' and 'Discovery'.

Take, for example, the former's 'Concerto for a Rainy Day', which culminates in the instantly-recognisable 'Mr. Blue Sky'. There was a tremendously 'big' sound and a wide variety of musical textures on offer here; the CXN meets their challenge. Subtler details were evident too, yet there was no hint of confusion when it all cranks up. Basslines were tight and well-defined, and rhythms impeccably-timed.

Hardly surprisingly, large-scale orchestral works also fared well with the CXN.

I then switched to something

completely-different – a DSD of Keith Greeninger and Dayan Kai's minimalist 'Looking For A Home'. Every string-scrape, vocal breath and dobro twang of this stunningly-beautiful track was there to be heard.

CONCLUSION

The CXN is an incredibly versatile piece of equipment. It was able to play every track I threw at it – AAC, MP3, FLAC, WMA, WAV, DSD and convey their sound quality accurately. It is also supremely user-friendly, courtesy of the Connect app and colour front-panel display. The digital preamp mode, Spotify functionality and Internet radio tuner are merely the icing on a delicious cake.

MEASURED PERFORMANCE

Both the electrical and optical S/PDIF digital inputs of the CXN accepted up to 192kHz sample rate. Since many optical inputs manage 96kHz maximum, this is a good result, enabling the CXN to reproduce 192kHz digital from the optical output of Astell&Kern portable players for example, where others fall silent.

Dynamic range measured a high-ish 115dB from 24bit, and a respectable 103dB from 16bit (CD) digital inputs.

Dynamic range values were identical through both balanced XLR and unbalanced phono socket outputs, another plus point. However, 120dB is being achieved with 24bit nowadays by many DACs, so the Cambridge is behind the best in this important parameter.

Distortion was low at 0.04% from 24bit and 0.2% from CD, both excellent results.

Output from the XLR measured 4.2V and phono 2.1V, both normal figures.

The USB B socket input for computer connection worked to 96kHz sample

rate maximum, an unusual limitation since many USBs accept up to 384kHz. Yet from a USB key (memory stick) mass storage device the CXN read up to 192kHz sample rate. Both USB inputs gave 115dB Dynamic Range, like S/PDIF; there was no degradation here as sometimes occurs.

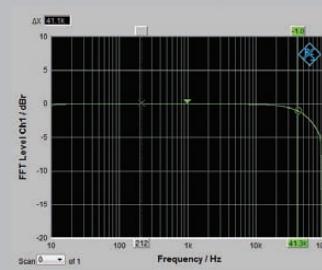
The upper frequency response limit was 41kHz our analysis shows, with 192kHz sample rate digital, with a slow roll off to the 96kHz analogue limit.

The CXN measured well all round. It isn't class leading in its figures but it is consistent in terms of dynamic range. NK

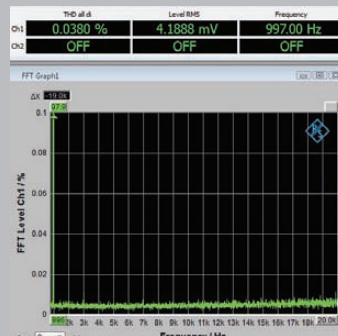
Frequency response (-1dB) 4Hz-41kHz

Distortion (%)	
0dB	0.008
-60dB	0.04
Separation (1kHz)	96dB
Noise (IEC A)	-114dB
Dynamic range	115dB
Output (phono/XLR)	2.1 / 4.2V

FREQUENCY RESPONSE



DISTORTION



CAMBRIDGE CXN STREAMER/DAC, £700



OUTSTANDING - amongst the best

VALUE - keenly priced

VERDICT

One of the best streamers I've yet come across. I'll be sorry to see it go...

FOR

- punchy, dynamic and focused
- wonderfully versatile
- good-looking and easy to use

AGAINST

- no Bluetooth
- no 5GHz Wi-fi support

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CHORD CLEARWAY DIGITAL INTERCONNECT £100

Chord made a genuine leap forward with the introduction of its ARAY range of digital and analogue interconnects. Here was a new cable topology that really could bring an extra degree of openness and clarity to a system.

The original range came in at the higher end of the company's series of cables – but the Aray technology is now trickling down to more affordable models. I was

mighty impressed with the £45 C-Line analogue interconnect (see review *Hi-Fi World* May 2015) and now there's the Clearway digital interconnect – which comes in at £100 for a 1 metre length.

The cable features a solid core, oxygen-free copper core, with low-loss polyethylene insulation, a high-density braided shield and the Aray conductor. Chord says this design reduces interference and internal reflections and eliminates changes to impedance – a crucial factor in maintaining signal integrity. It's available with RCA, BNC or mini-jack connectors.

Like other Aray products the Clearway is characterised by a clean, open sound with great dynamic range.

Swapping out my usual interconnect from between a Naim

NDX and Chord 2Qute DAC and the Clearway had a clearer, more open sound with improved instrumental separation.

On John Coltrane's 'Ascension' what can sometimes sound like an unstructured cacophony gained immediate focus with the clever interplay between the musicians being brought into sharp relief.

The Clearway seems to let the music flow naturally – with none of the occasional smear or slight veiling of frequencies that some digital cables can impart.

That translates to a vibrancy on all genres of music, with deep, impactful bass, shining but never edgy treble and smooth midband.

At just £100 the Clearway brings Chord's Aray technology within reach of a much greater number of people. If you are looking to improve the digital side of your system this is a must-hear. **JM**

[The Chord Company
www.chord.co.uk]

SOUNDBITES

LINDY CROMO IEM-75 £70

What do you want from a pair of £70 in-ear monitors aimed firmly at being used while on the move? Arguably a sturdy construction to withstand being pulled in and out of pockets/bags, a comfortable fit and, most importantly, decent sound for the price.

German manufacturer Lindy seems to have hit all those targets with their Cromo IEM-75s. They are undoubtedly sturdy, having metal housings as opposed to the more common plastic casings. The feel is also comfortable once you decide on the right ear-tip (three are included along with a compact carrying pouch).

Sound-wise they are up with the best at this price – helped by the fact they use dual 7mm and 15mm drivers for mid/bass and high frequencies. They also don't attempt to over-emphasise the bass as some other 'phones under £100 do. Instead they are fairly neutral and so sound

natural and open.

On Leonard Cohen's 'First We Take Manhattan' via a FiiO X5 the Lindys captured the atmosphere of the track with good separation between the vocals and sparse instrumentation.

Those dual drivers help present a large soundstage as well, meaning you don't get the feeling music is being pumped into your ears but more that it is floating around you. They don't skimp on detail either, the subtle electronic embellishments on parts of New Order's 'Technique' (24/96) coming over clearly instead of sinking



into the background.

As in-ear 'phones at this price go there's little to fault. The even better part, though, is that if you shop around you can get them at a significant discount at the moment. **JM**

[LINDY Electronics Ltd
www.lindy-headphones.co.uk]

Five Alive!



Brighton-based Alacrity Audio has its own take on loudspeaker design – but it's one that works, finds Jon Myles.

It's often said there's nothing particularly new in the world of loudspeaker design. Okay, manufacturers occasionally introduce new and exotic materials for their driver units or cabinets but the basic design elements have remained pretty much the same for years and there's not much new to be learned surely?

Well, not according to Alacrity Audio's Jon Carroll - who claims his range of loudspeakers is breaking new ground with its Acoustic Induction technology. For a full, unexpurgated explanation I'd recommend a visit to Brighton-based Alacrity's website (www.alacrityaudio.co.uk) but, basically, it's a cabinet loading technique that is aimed at eliminating resonant frequencies by converting energy into a standing wave that does not allow the bass units to move significantly. Jon Carroll claims this restricts the linear excursion of the bass unit without harming output efficiency and so flattens the impedance curve to create an exceptionally smooth response.

The technology was first used in Alacrity Audio's Caterthun standmount 'speakers but has now been extended to the £4495 Dundee 5 floorstander on review here – where it's married to a transmission line said to provide exceptional bass from a tall but narrow cabinet.

Truly different then...or just another case of over-enthusiastic marketing flim-flam? The cynical among you will probably plump for the latter. And I'll admit I harboured a good degree of scepticism as I unpacked the Dundee 5s from the sturdy flight cases they ship in. After all, how many loudspeaker companies claiming great strides in design have we seen come and go over the years?

But the more I listened the more my scepticism began to ebb away and be replaced by a healthy degree of respect as to what these slim floorstanders are capable of.

And slim they are – being just 165mm wide while rather tall at 1200mm and 265mm deep. Despite that height there's only two drivers; a

135mm woven cone mid/bass unit and a 20mm soft dome tweeter.

Halfway down the cabinet is a cut-out section which houses a specially-made foam insert which, to be honest, looks rather strange but is part of the Acoustic Induction technology.

The rear panel houses twin loudspeaker binding posts and the transmission line's output port that – unusually – is undamped.

So, as our pictures show, the Dundee 5s definitely look different from your usual loudspeakers. And they also sound it too...

SOUND QUALITY

The most striking quality about the Dundee 5s is their overall coherence. There was little that was exceptional at first – but then, after listening a little longer, I found their qualities started to come through.

Chief amongst these was the quality of their bass. This loudspeaker goes exceptionally low but does it in a very controlled manner. As such you don't get any artificial boom – just an accurate and realistic reproduction of low frequencies.

James Blake's 'Limit To Your Love' was testament to this. This track has strong sub-sonics that can be overpowering and become blurred if the loudspeaker unable to reproduce them well. The Dundee 5s, by contrast, were supremely accurate, never sounding strained no matter how high I turned the volume up on a variety of amplifiers.

Instead they relayed the full power of the bass track, while above that Blake's gentle and rounded vocals were clean and clear with no obvious sibilance and very good definition.

Interestingly, moving the position of the Dundee 5s in respect to a rear wall made little difference to the bass quality, indicating that the speakers are not as room dependent as some others.

I also found them exceptionally rhythmic. The likes of The Killers' 'When You Were Young' simply bounded along, while Imelda May's 'Johnny Got A Boom Boom' was fast and frenetic but never so out of control I couldn't tell what the musicians were doing, or marvel at the interplay between them.

If there's any criticism to be levelled against the Dundee 5s it's in the sense of absolute scale. The clever cabinet construction

has undoubtedly squeezed the last drop of performance out of relatively small drivers, but playing Aaron Copland's 'Fanfare For The Common Man' there wasn't the visceral impact of bigger loudspeakers with larger drive units. Nor was there quite the same instrumental separation and sense of an orchestra being laid out before you.

Whether that's nit-picking will depend upon what you might expect at the price. Because Alacrity Audio's Dundee 5s are otherwise a good set of loudspeakers which never failed to engage my senses.

CONCLUSION

At a shade under £4500 the Dundee 5s are up against



some stiff competition from a number of more established manufacturers. But in terms of value for money they are more than good enough to warrant your attention.

On bass quality alone they can shame some loudspeakers costing a whole lot more while the midband and treble were smooth and well integrated. Their looks might not be to everyone's taste – but their sound could well be.

The Dundee 5 has two sets of loudspeaker binding posts to facilitate bi-wiring. The transmission line's port vents at the top of the tall cabinet.

MEASURED PERFORMANCE

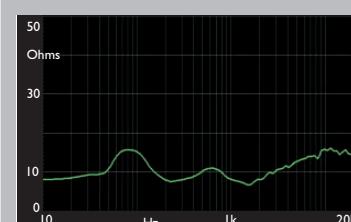
The Alacrity Dundee 5 had a reasonably even frequency response characteristic over the audio band, our analysis shows. Output at 100Hz is the same as that at 10kHz (high treble), meaning it is tonally balanced.

High frequency output above 2kHz was smooth, ensuring good rendition of detail but an absence of either spitty or dull treble. Below 2kHz output from the bass/midrange unit is 2dB or so higher than that of the treble unit, providing a sense of body to the sound. Around 200Hz a large peak and dip suggest sudden phase change imposed by the

FREQUENCY RESPONSE Green - driver, Red - port



IMPEDANCE



internal line, and this is likely to colour the sound a little.

The Dundee's tall cabinet and long internal acoustic line give an unusual bass performance. Although bass output falls slightly below 100Hz it falls less than most loudspeakers, suggesting dry but well maintained low bass. The port's output peaks a little at a low 30Hz and so does forward output, meaning the loudspeaker goes very low and will produce subsonics, but not at an overpowering level. It has deep bass, but is restrained and will not over excite room modes – a nice balance that suggests very good bass quality.

Sensitivity was low, 81dB sound pressure level being produced from 1 Watt (2.8V) of input where most loudspeakers produce 87dB or more nowadays. The reason is Alacrity have used an 8 Ohm bass unit, where most manufacturers these days use a 4 Ohm unit. It draws less current and power, reducing sensitivity. The 'speaker needs a 60 Watt amplifier to produce decent volume.

The Dundee is an interesting and characterful loudspeaker. It reaches low and produces deep bass, but not heavy bass. There's some unevenness in response due to internal cabinet behaviour but overall it's tonal balance is even and accurate. **NK**

ALACRITY DUNDEE 5 £4995



EXCELLENT - extremely capable.

VERDICT

Deep but controlled bass allied to a rather sumptuous midband and treble translated to an engaging sound. Definitely worth investigating.

FOR

- deep, tuneful bass
- slim cabinet
- engaging sound
- not fussy on room placement

AGAINST

- slight lack of absolute scale
- price
- finish

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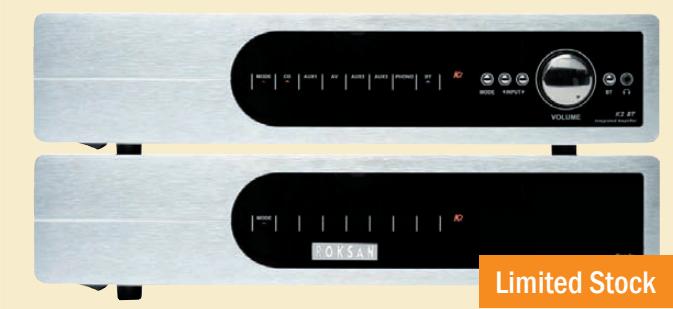
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THE ALLMAN BROTHERS BAND

5 Classic Albums
Mercury

This new CD box set of five Allman Brothers albums – and everyone is a scorcher, it has to be said – arrives in a clamshell box, while each album sports a miniature, replica vinyl sleeve.

'The Allman Brothers Band' (1969), a well balanced master, provides a structured soundstage and instrumental separation that allows you to still easily hear secondary percussion in the background, even when the guitars are screaming in the foreground.

'Idlewild South' (1970) retains this rather spacious soundstage effect which is highlighted by the vigorous acoustic guitar strumming during the introductory section of 'Revival'. As with the first album, there is a slight coolness around the presentation, however, but this also enhances the overall precision.

'Brothers And Sisters' (1973) offers slightly more compression than the first two albums, which can be detected during vocal and

guitar crescendos. It's not a major issue but it's there. The corollary of that is the tighter, punchier bass performance while bass guitar is rather more prominent in the mix.

'Eat A Peach' (1972) maintains the previous compressive levels but also forces the soundstage left and right to provide a broad, rather epic nature to the mix which is the busiest, grandest soundstage presented thus far. Instrumental separation remains good while upper mids provide plenty of detail.

Finally, the live album, 'At Fillmore East' (1971), is surprisingly intimate with plenty of fragile treble emanating from accompanying cymbals and, despite the rather more understandable constriction in dynamics, is also open in terms of the soundstage. The audience never intrudes upon the performance but participates enough to retain atmosphere.

Brilliant albums, well mastered and great value at around £24 for the lot.

AUDIOPHILE CD



NURSE WITH WOUND

The Sylvie And Babs High Thigh Companion
United Dirtier

Some avant-garde industrial (?) noises for you from the king of the genre, Steven Stapleton's Nurse With Wound, featuring a range of conflicting, discordant samples, humorous melodies displaced from a chaotic background and almost Monty Python-esque sonic situations

In terms of mastering, apart from a certain digital coolness that can plainly be heard in and around both the vocals and the lower bass, the presentation is precise without being clinical. The interplay of noise, samples, voices and innovative sound constructions means that the soundstage is forever changing and reforming. This is sound that often jumps out and surprises you and, in the case of this particular release, swamps you with nostalgic excerpts from films of the past. The tone is never down, dramatic or, indeed, scary. Then again, there are several waking nightmare moments. In fact,

this release is almost a media stew of fascinating snippets from times past. Everything from Charleston-dance musical manoeuvres to Sophia Loren-esque purring in a passing Peter Sellers film, plus Spike Jones-like big band mayhem.

This release is not new, this is a 'deluxe' re-issue re-mastered by Denis Blackham. Packaged in six panel gloss laminated digipak with a twelve-page booklet with artwork by Babs Santini. This edition includes a bonus disc of outtakes, unreleased material and remixes from Irr. App. (Ext.) and Andrew Liles.

If you're looking for a great night out but can't afford to actually leave the house then open a can and let these discs play out, you'll have the time of your life.

From the same label, also look out for Liles' own industrial release, 'First Monster Last Monster Always Monster' plus Japanese noise artist Merzbow's 'Wildwood'.

Jo had a distinct delivery. This R&B singer offered a voice of clarity. Added to that was Jo's precise delivery. Her articulation was supreme. While she relaxed on some words, she was not averse to pronouncing those trailing 't's or wayward 'd's at the ends of words or lines with gusto. With Jo, there was often no need to seek out a lyric sheet. She was concise and understandable.

There are a host of singles on this two CD collections that span both 78s and vinyl from the mid to late fifties and early sixties period. You also get three albums.

The most intriguing is the ABC-Paramount release 'Big Fifteen'. A delayed release, it appeared in 1961 but featured songs created in 1956 and 1957.

These early tracks – along with singles from the early 50s – display a compressed, rather claustrophobic presentation.

As a sort of answer song to the Drifters' 'Save the Last Dance for Me', Jo's best known hit was the 1961 release 'I'll Save the Last Dance for You' from the 1961 Mercury album of the same name. This album provides a much more mature master.

This early stereo issue offers a broad soundstage while Jo's vocals are expressive and emotive. Similarly, her late Mercury release 'Sing A Country Song', also included here, offers another, intriguing side to Jo's vocal talents. A collection that is full of variety and welcome rarities.

Also look out for other releases this month from Jasmine including Bobby Rydell's 'All The Albums 1961-1962' including 'Bobby Salutes the Great Ones' and 'Rydell At The Copa'; two guitar albums – 'The 50 Guitars of Tommy Garrett', and 'Play In A Day' from Bert Weedon plus the charismatic band leader Buddy Johnson And His Orchestra in 'Rock On'.



DAMITA JO

Love Laid Its Hand On Me
1952-1962
Jasmine

AUDIOPHILE CD

These authorised sets collect a host of music that was played on the long running radio shows hosted by Bob Dylan which began in 2006 when Dylan had just hit his 65th birthday. The radio shows were a bit of a shock because the normally shy Dylan was not only talking live on air but he was doing a hell of a lot of chatting, spanning a host of musical subjects, displaying opinion, wit and his own brand of twisted intelligence! These revealing radio shows were, indeed, an accompaniment to his 'Chronicles' biography.

The content of each radio show showed some startling musical choices but this Ace collection leans more towards the archive such as 'Black Coffee' (1960) via Bobby Darin from 'Volume One', Jerry McCain's 'That's What They Want' (1955) from 'Volume Two' and 'I'm Nuts About Screwy Music' from Jimmie Lunceford (1935) from

'Volume 3'. That said, there are releases from more contemporary times (Bonnie Raitt & Was (Not Was) with 'Baby Mine') and newer performances such as The White Stripes' 'Seven Nation Army'. Thus, the music remains wide and varied.

What you don't get is the voice of Dylan himself spouting his witty snippets, poetry and more but I guess that copyright issues heaved into view on that score. What you do get, though, is full documentation from the radio show reference of each song and, within the generous glossy booklets, plenty of information on each and every song from a host of writers.

In terms of mastering, as you might expect with this set, the music is very well presented using Ace's excellent studio facilities. For example, the tale of passion from Bobby Bland's '36-22-36' is open, natural, detailed and airy, full of expressive clarity and a rich, broad soundstage. **PR**



BOB DYLAN

Theme Time Radio Hour, Seasons
1, 2 & 3 With Your Host...
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Spendor D7

Among the finest speakers I've heard at any price
Sam Tellig, Stereophile Nov 2014

Spendor's approach is the most radical I've seen, going where no hi-fi manufacturer has gone before. D7 is extremely capable and very neutral, but most importantly it puts the music first

Hi-Fi + Dec 2013

If you're after a great all-round, affordable, high end loudspeaker, here it is
Hi-Fi Choice issue 370 2014

D7 has an unmistakeable touch of magic. Easy to drive, genuinely efficient, undemanding of placement, fine stereo, extended powerful bass, upbeat and well-balanced, build and finish first rate.

What more can one ask?
Hi-Fi Critic Sep 2013

However it's been achieved, we can't help but marvel at the sound from the D7's. Spendor D7's set the standard for speakers at this price
What Hi-Fi Oct 2013

Bass punch allied to tremendous mid band and treble insight makes for a winning combination
Hi-Fi World Jul 2014



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Hi-Fi + Sep 2015

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Hi-Fi World Oct 2015



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Spendor D1

Coherent Thinking

Jon Myles believes Black Rhodium's specially-treated interconnect and loudspeaker cables could be a perfect upgrade - no matter how much your system costs.

I make no apologies for being a big fan of using a coherent cable loom in your system. While some people prefer a mix-and-match strategy, there are good reasons to look to employing a set of interconnects, speaker cables and, if needed, digital leads from one company.

Most obviously, they are likely to have been manufactured to work well together – using similar materials, construction and cable geometry to bring a consistent sound.

So no surprise, then, that I was more than keen to try out a pair of Black Rhodium's Aria DCT++ RCA interconnects and Athena DCT++ loudspeaker cables working in tandem.

Although not the company's ultimate cables, this pair sits at the higher end of the Black Rhodium range, costing some £2600 taken together. Admittedly, some people may balk at paying that sort of price for cables but there's no doubt it's an upgrade that can often bring greater benefits than replacing a source component or plugging in a new amplifier. As long as you choose wisely.

The DCT++ in the title of the cables indicates they have undergone deep cryogenic treatment to give a more uniform molecular structure - while Black Rhodium also applies its

proprietary Crystal Sound Process which it says refocuses the outermost skin of the conductor to aid conduction properties.

Both 'speaker cables' and interconnects use silver-plated copper conductors and also come equipped with designer Graham Nalty's VS-1 vibration stabilisers - heavy metal barrels which act to reduce distortion by controlling mechanical vibrations travelling through the cable.

Twist and lock Rhodium-plated connectors on the Athenas also ensure a firm grip on 'speaker binding posts.'

SOUND QUALITY

Used with a variety of amplifiers (including Creek Evolution 100A integrated, Quad QMP monoblocks and McIntosh MC152 power amplifier) the Black Rhodium combination consistently displayed two overriding characteristics - an impressive frequency response and coherent top to bottom integration.

On the Dave Brubeck Quartet's 'Take Five', for example, Joe Morello's kick-drum played via a pair of Tannoy Definition DC10Tis just doesn't have body, it has a visceral slam that hits you in the chest. This isn't a minor improvement – it's an absolutely major one that adds real body to the music.

With that foundation laid, Brubeck's piano and Paul Desmond's alto sax get a lot more room to breathe in the higher registers. What you are hearing is real breadth and depth. A quality which remained consistent no matter what combination of amplifier, loudspeaker and source I tried. Indeed, using the Arias and Athenas together with a pair of Quad S2 loudspeakers and an Audiolab 8300A



Black Rhodium Aria DCT++

amplifier (both reviewed in this issue) was a revelation. On paper this would seem a total mismatch (the cables costing a whole lot more than the components) but in reality it worked exceptionally well. Here the transparency of the Black Rhodiums allowed the ribbon tweeters of Quad standmounts to really sing while making the most of the Audiolab's smooth power delivery.

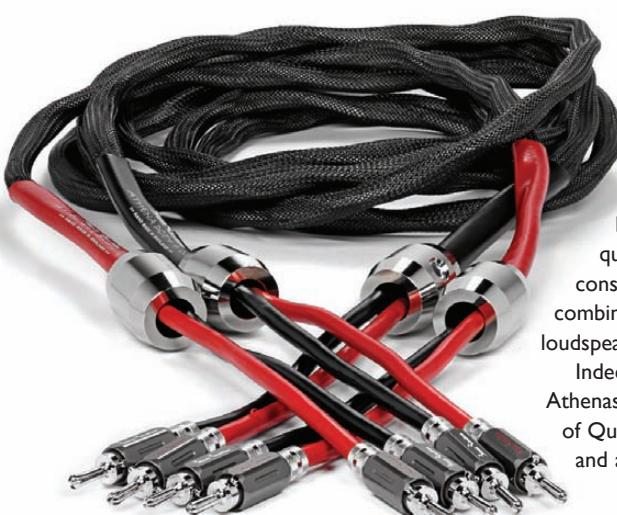
So on Get The Blessing's 'OC/DC' (24/96) the saxophone took on a greater tonality and sense of realism while the walking bass punched with rather more power than you'd expect from such small loudspeakers. I had a sense that I was hearing more than the sum of the parts of the system – a natural synergy in terms of music-making.

Much of that was down to the fact that these cables were not imposing too much character of their own on the system – simply allowing it to show what it can do.

Admittedly, pair them with inferior sounding components and they'll let you know about it. But use them in a good mid-range and upwards system and they'll shine.

CONCLUSION

The Aria DCT++ interconnects and Athena DCT++ loudspeaker cables are a potent combination. They are uncoloured with a natural sound which doesn't emphasise any particular element of the frequency spectrum. They might not be cheap, but they have the ability to bring the very best out of whatever components they are matched to.



BLACK RHODIUM ARIA DCT++ £1000 (1 METRE)

BLACK RHODIUM ATHENA DCT++ (£1600 3 METRE PAIR)



OUTSTANDING - amongst the best

VERDICT

An extremely capable pair of cables that display a natural synergy and are able to bring the best out of any decent system.

FOR

- open, uncoloured sound synergy
- build quality

AGAINST

- won't flatten poor components

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Your guide to the best products we've heard that are currently on sale in the UK...

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CLEARAUDIO INNOVATION

£6400

Expensive, but offers great results from a finely honed and beautifully finished belt drive turntable, with servo control from the platter to keep a grip on tempo like few others. Can be fitted with a Clearaudio tangential arm, or any conventional design. Awesome.



INSPIRE MONARCH

£4,350

A rebuilt from the ground up Technics Direct Drive, having blistering pace and dynamics allied with smoothness, sophistication and purity of tone. A true reference.



LINN LP12SE

£3,600

The UK's most iconic turntable, the legendary Sondek goes from strength to strength. New Keel sub-chassis and Radikal DC motor add precision and grip to one of the world's most musical disc spinners. Expensive though.

MICHELL GYRO DEC

£1700

Wonderful styling coupled with great build and finish make this turntable a delight for friends and family. It has an attractive clear acrylic dust cover, and you can mount just about any arm. A current design standard.



PRO-JECT ESSENTIAL DIGITAL

£300

A budget turntable that turns in a great analogue performance, but also has a hi-res digital output. Send 24/96 across your lounge via optical cable to a DAC and get great audio quality. Or record LP to your laptop.



REGA RP3

£550

The first of the super-quality Regas, little compromised by price and featuring Rega's outstanding RB303 tonearm, suitable for MM and MC cartridges. A standard at the price point.

TIMESTEP EVO

£2100

The famous Technics SL-1210 MkII Direct Drive but with improved plinth, isolation, main bearing and power supply, plus an SME arm (add £1500). DD convenience, rock steady pitch and fab sound at a great price. Our in-house reference.



TONEARMS

ORIGIN LIVE ENCOUNTER MK3C

£1,745

Origin Live combines carbon fibre and ebony to marvellous effect in its new 12-inch arm. Creamy and rich in presentation, the Encounter delves deep into the mix for a satisfying listen.

HADCOCK GH-242 EXPORT

£810

Consummately musical, lyrical sounding tonearm, but needs the right turntable.

ORIGIN LIVE ONYX

£450

Easy, smooth, creamy nature that reminds you why you're listening to vinyl in the first place. Essential audition at the price.



REGA RB303

£300

A one piece tapered casting makes this arm's structure almost unrivalled. Great dynamics and superb imaging, for MM and MC. Reference quality for peanuts.

SME 312S

£1,600

Twelve inch magnesium alloy tapered arm tube plus SME V bearings. An insightful yet smooth and relaxed sound. Superlative build completes the package. Our Editor's steed.



SME 309

£1500

A one-piece tapered 9in arm finished like a camera and slick to use. Superlative SME quality and sound at affordable price.

SME V

£3000

Offers rapid fire timing and a sense of precision, plus rock solid dynamics. Top dollar for deep pockets.

CARTRIDGES

AUDIO TECHNICA AT-OC9 MLIII MC

£420

A fine sounding MC with strong bass and super fine treble from a great stylus – yet inexpensive.



AUDIO TECHNICA AT-F3/III MC

£150

Great value entry level moving coil with detail and grip you just can't get from similarly priced moving magnets.

BENZ MICRO ACE SL MC

£595

Smooth, lucid and full-bodied, award-winning, hand-made cartridge from Switzerland.

BENZ MICRO WOOD SL MC

£945

Highly finessed Swiss moving coil that plays music with riflebolt precision.

DENON DL-103

£180

A popular and much loved budget MC with big bass, smooth treble and deep sound stage. Fantastic value.



LYRA TITAN I MC £3,500
Breathtaking speed and dynamics from LP, helped by diamond coated, boron rod cantilever.



ORTOFON 2M MONO SE MM £80
A mono cartridge purposed for The Beatles in Mono microgroove LPs. Fitted with a top quality Shibata tip. Fab for the four.



ORTOFON 2M BLACK MM £400
As good as it gets from MM. Fabulous detail and insight from a Shibata stylus, good bass and excellent tracking.



ORTOFON CADENZA BLACK MC £1,800
Ultra smooth and dimensional moving coil with bass and punch aplenty. Lovely stylus.

ORTOFON A95 MC £3,750
Fast and extremely detailed, this is an MC cartridge that sets standards.

REGA CARBON MM £35
Budget price for a competent cartridge with a fairly unflappable nature. Ideal for beginners.



GOLDRING 1012GX MM £250
A glorious sounding cartridge with solid bass and strong dynamic punch, plus excellent treble from its Fritz Geiger stylus. Fun and affordable.



SHURE M97XE £80
Big warm sound, but great tracking and bullet proof stylus protection from damped guard. A survivor.

VAN DEN HUL DDT-II SPECIAL MC £995
Long-established cartridge from Holland with an open and dynamic sound.

PHONO PREAMPS

CAMBRIDGE AUDIO 651P £200
Clean, concise sound from MM and MC cartridges at a very low price. A real bargain.

ICON AUDIO PS3 MKII £1,200
All valve MM phono stage with MC transformer option, graced by big, spacious and relaxed sound.



IFI IPHONO £350
Multi EQ phonostage from British manufacturer that punches well above its weight. Substantial bass and open midband.



LEEMA ACOUSTICS ELEMENTS ULTRA £1,199
Smooth and detailed sound with the ability to accommodate most modern cartridges. Exceptional value for money.



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MM and MC, oodles of gain, a volume control – and valves! Looks superb and sounds even better: smooth, atmospheric and big bass.

TIMESTEP T-01MC £995
New, minimalist phonostage that sonically punches well above its weight.

PREAMPLIFIERS

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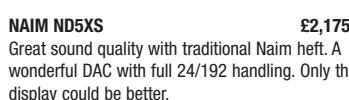
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"It's a pity the Technics SU-7100, in all its analogue loveliness, couldn't be replicated today"



Noel Keywood

Ah - those bendy sockets! Plugging stout phono leads from our SME 309 arm into the cheap, tin plated phono sockets of a 1978 vintage Technics SU-7100 amplifier and watching its cadmium-plated, mild steel rear panel bend took me back in time. That's how they built 'em in the 1970s and it looks rubbish to modern eyes.

Oh boy, much of that kit was bad, yet it could sound good all the same – and some retro-philes are convinced that sound quality was better then than it is now. There may be something in this assertion. We have been on an upward path in all things mechanical for a very long time, but not necessarily in all things electrical; so old products can look like tat, but sound quite good.

Just look at early Leak and Quad valve amplifiers for example. They are products of the 1960s and you'll see not only nasty, stamped-out, tin-plated input sockets but loudspeaker outputs comprising a screw in a metal plate, Paxolin mounted, designed to accept bell wire, as it was known. Ugh!

Then there were output transformers that had as little metal in their cores as possible. As a result Quad's admired Quad 2 valve power amplifier overloaded early at low frequencies, Peter Walker telling me this was deliberate as it helped avoid putting heavy bass into Quad's ESL-57 loudspeaker. Hmmm...

From my days helping design and component order World Audio Design valve amplifiers I learned that weight is a big issue in product design, especially when it comes to valve amplifiers. Small transformers cost less to build – and to ship by keeping product weight down, keeping final sell-through price reasonable. Even packaging costs less.

When we shipped heavy

valve amplifiers around the world – especially Australia where they were mysteriously popular in remote regions – packaging was crucial.

The issue was this: when a kit valve amplifier was thrown off the back of a lorry the heavy transformers tried to keep going on their trajectory earthward. We had to cushion the fall with layers of industrial strength bubble wrap – nothing else would stop heavy transformers punching their way through layers of cardboard and anything else that stood in the way.

If the transformer is mounted on a steel chassis, then the chassis you hope – as a manufacturer – will deform and spring back, just as the rear panel of the Technics sprung back and as mild steel car panels will spring back if not deformed too far. But aluminium and – especially – copper do not spring back: they bend and stay bent! Which is why soft aluminium and copper chassis are rare in hi-fi. And why bendy mild steel chassis are used by everyone, including Technics, since the beginnings of hi-fi (ignoring other benefits). It's another reason Quad transformers were small and light I suspect.

Modern parts have improved no end however and today we have at our disposal a much wider variety of high-quality components, mechanical like switches and electrical like capacitors, available to improve sound quality and provide longer operating life. Yet still those old amplifiers can charm with a certain easy smoothness – and their ornate mechanical construction looks anything from good to fantastic: check out a Pioneer TX-7500 tuner for example. Compare that to a blando-box of today!

The SU-7100 intrigued me. I wasn't overly impressed by much of it, cheap Japanese mass production

techniques/tricks being glaringly obvious. The volume control felt light, moving smoothly on a detent, clicking up and down in a satisfying fashion. Unfortunately, such 1970s volume controls – used by others as well as Technics – hid a dirty secret. Behind the fascia and out of sight sat a tiny rotary volume control (potentiometer) that was cheap, of poor quality and short life. It felt good but it was rubbish. Movement against a detent mimicked the feel of a switched potentiometer but these are hugely expensive, up to £200 apiece – even more. What a fake these controls were then.

So 1970s amplifiers mimicked the expensive with the cheap. Even Technics lever switches clicked smoothly between positions – lovely. But the construction of old switches was commonly crude and they soon gave up the ghost.

If you buy such an amplifier today these problems await you. All the same, if all has magically kept going for what is now forty years, you may well be impressed by what you hear.

Transistor amplifiers like the Technics were largely discrete designs, using simple yet effective circuits not suffering the peculiar limitations of silicon chips that are ubiquitous these days. That's an advantage but the audio transistors produced a lot of distortion. That's the drawback. You get a different type of sound as a result.

Mediocre component quality added a slightly turgid air to the midband, disguising detail. All the same, at the end of it all, sound quality wasn't bad.

So I harbour some nostalgia for these old products. It's a pity the SU-7100, in all its analogue loveliness, couldn't be replicated today but with better input sockets and a rear panel not plated in toxic cadmium. Some things have improved! ●

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WHAT HI-FI?

"On The X Factor raw talent is remoulded from the potentially unique into the sellable"



Paul Rigby

I tend not to watch TV. Well, I do, but it is usually specialist stuff: documentaries, some sports, the odd ancient film, etc. I prefer to avoid trashy entertainment, soaps and the like. There's not enough time in the day to waste on this rubbish. Oddly, it was a reference to one element of this 'rubbish' on a BBC website that formed a trigger for the theme for this month's column.

As I was noting the rise of Liverpool FC under their new German manager Jürgen Klopp I spied an argument, in my peripheral vision, raging around the judges of the TV talent show, 'X Factor' and the contestants.

The argument consisted of... well, I really can't remember, to be honest and I don't really care. I seem to remember falling asleep after the second line of the news report. What did and does strike me, though, is the contestants on this and similar programmes. What's the other one, *The Voice* is it?

If I have ever had the misfortune to stumble over one of these shows while organising a recording schedule for a selected programme, what I have immediately noticed are the faces of the poor contestants. The looks on their faces. The yearning. The need to win. The desperation to be liked. The sheer panic that they will be rejected. The fawning over the judges. The constricted nature of their performances. The absolute straight-jacket that they willingly pour themselves into in order to grab even the fleeting chance of fame.

That night, I relaxed into a heap of vinyl via my reference system and was listening to the talented finger-picking motions of the supreme guitar player Leo Kottke (a man who has a vastly underrated voice, incidentally).

Kottke has a beautiful guitar style but it wasn't Kottke who fused together with my X Factor memories, it was the man who discovered him – a certain John Fahey.

Kottke said, "John is one of the heroes of whatever this country has for a culture – including his attitude, that persona he created..."

What John made available to everybody was a point of view that really didn't exist before he came along. Point of view is the whole thing in a nutshell, no matter whether it's music or prose or whatever you're talking about. Technical innovation is something a computer can do but point of view comes from people like John".

Fahey is often seen as the father of the finger-picking guitar. Or rather, while other people finger-picked a guitar, the style that Fahey adopted was entirely his own.

More than that, he didn't care. That is, he didn't care if you liked his work. He didn't care if you listened. He didn't even care if you left halfway through.

Later on in his career, like all true artists, Fahey's style developed and evolved. He became more avant-garde in his nature. He became more left-field.

For example, he would use the resonances of a plucked string and let the sounds from that float in the air and then play with the silence.

During this later period of his playing, this change in his approach lead to a fair bit of grumpy responses from his audience who, yes, often walked out. Fahey didn't mind, though. He knew that what he was doing was correct. He had conviction in his talent and his direction.

And he knew that the direction that he was taking was his decision and was right for him.

Fahey never had some shallow, semi-literate, semi-skilled, teeth-whitened, Dior-bedecked, pretentious, conceited, condescending image monster trying to manoeuvre him into an artistic cul-de-sac or attempting to destroy any native, natural talent that he had to enable him to become a clone of the industry.

That, unfortunately, is what happens on X Factor. Raw talent is crushed and remoulded from the potentially unique into the 'sellable' a state of being that, by its very nature, lasts all of fifteen minutes (according to Andy Warhol).

We want our artists to be indomitable. We want them to say, "Here is what I can do. Now, you come to me".

We should never tell an artist to move towards us ('us' being society). Artists have to be individual, outside of society. They help us to see outside of ourselves. To question ourselves. To see a new way of thinking.

That's what John Fahey did and, if you check out his music, still does. I have a few CDs of the man here on my desk via the Takoma label, a label he part founded.

Such CDs can be found on popular retail sites such as Amazon et al. If you have never entered the world of Fahey, try classics such as 'The Legend Of Blind Joe Death' (1996; a collection of early rarities), 'The Transfiguration of Blind Joe Death' (1965; a playful and yet also a dark album) and 'America' (1971; an ambitious yet also inventive release).

Fahey's work is sprawling and covers decades but it's always innovative and, above all, independent of mind and spirit. Which is not something you can say about the majority of the contestants on shows such as The X Factor and The Voice. ●

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“Already the music streaming market seems to be moving towards a handful of major players”



Jon Myles

Students of business will tell you there's a theory that says there is a distinct bell curve associated with the growth of new industries. Generally, one pioneer emerges and grabs the first-mover initiative. But if the product proves popular they are quickly joined by other companies. And then, as the market starts to mature, a period of consolidation begins where the various companies merge, are taken over or simply perish to leave just a handful of dominant companies.

The recorded music industry is often cited as a prime example of this. Way back when LPs were a new technology, they quickly caught the public's imagination, becoming popular at a faster rate than anyone ever imagined. This attracted a whole host of new record labels into the market for recorded music. One only has to look at the hey-day of the independents during the late 1970s and early '80s to see how the number of labels had expanded.

But the market began to reach maturity – meaning peak sales figures in terms of revenue and actual physical product sold – at the beginning of the 1990s and has been steadily declining ever since. A decline which has also been mirrored by the number of major players in the market.

In 1988 there were six significant music labels. Ten years later that had been reduced to five, only to become just four a mere five years later. Now Universal Music Group, Sony Music Entertainment and Warner Music Group control an estimated 89 per cent of all global music sales.

The same pattern can be seen in many other industries (think steel, the drinks industry, cars). It's called IEC – innovation, expansion, consolidation.

Another part of this theory, though, states that the bell curve is becoming much more pronounced, due to technological evolution that has lowered the cost of introducing new products, speeded up their rate of adoption and allowed potential rivals to react faster.

So where once it could take 50 years or more for a new industry to go through the cycle, now it is happening in a much shorter timespan.

And again the music business is providing what could be a very interesting case study for future generations in the form of streaming services.

It's a relatively new technology which most casual observers will trace back to the rise of Spotify in 2008 – although the original concept was actually pioneered by Rhapsody some six years earlier.

Since then there's been a whole raft of different operators looking to enter the market with varying degrees of success.

Simfy was one that failed to get any traction and closed down despite a claimed catalogue of 25 million songs. Now France-based Quboz is – at its own admission – in financial difficulties and looking for new investment or a buyer. Whether either will appear is, at the time of writing, open to speculation.

But it highlights the fact that already the music streaming market seems to be moving towards a handful of major players – and will probably be dominated within a few years by maybe no less than just three companies much as the recorded music business is today.

The chances are Apple's Music service will be one of these – mainly because of the company's enormous financial firepower and the ability to sign artists to exclusive deals. Spotify also has a significant advantage

due to its already large installed consumer base.

After that it's very much a matter of take-your-pick as to who survives (Tidal or Deezer maybe?) but the chances are there will be no more than one or two left standing. A rather exaggerated bell curve but one that really should surprise no-one.

Which leads me on to a rather strange recent announcement from the BBC. Its Director of Music Bob Shennan has announced the corporation will be launching its own streaming app for Android and iOS devices early in 2016. The purpose, we are told, is to make the most of the corporation's music curation expertise (as in creating playlists and trying to guess what you might want to listen to) and its large back catalogue of sessions and live concerts.

All of which seems admirable at first glance – but does seem a rather strange move when there's already a huge debate under way as to how the BBC is currently spending the money it gets from the compulsory licence fee and whether it is actually providing good value for money.

There's no doubt the BBC's archives contain a great number of valuable and historic recordings but looking to stream them to iPhones or other mobile devices via its own app (developed with licence fee payers money) seems a strange way of making the best use of them. As does bringing another streaming service into the market.

Surely a better idea would have been to licence the music to other services and use the revenue to subsidise the BBC's core service – which is making TV and radio programmes – and not attempting to compete outside this mandate, using tax payers money to distort the market. ●

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"Did you know quadraphonic jukeboxes were sold by Wurlitzer rival Seeburg?"



Martin Pipe

So, it finally comes to an end – my extensive Olde Worlde series on quadraphonics. It is, I admit, far from exhaustive. I omitted for example quadraphonic headphones – needless to say, they are rather unwieldy and cumbersome contraptions! How about quadraphonic bootleg LPs?

And did you know that quadraphonic jukeboxes (for which QS singles were specially pressed) were sold for a while by Wurlitzer rival Seeburg?

And then there's the related topic of Ambisonics, or how to encode a sound field, a topic alive today that could justify a series of its own.

But for now, I'll round off matters by examining the first new matrix decoder to hit the marketplace since the mid-1980s. And it's most welcome, considering that the best existing units – notably the Fosgate/Tate II 101A for SQ, and Sansui's QS-D1000 – came too late to save quad. Few are around now, because not many were sold to start with!

Thus the need, in the light of revived interest in four-channel sound, for a device like the SM465 'Surround Master' from Australian firm Involve Audio (involveaudio.com). The SM465, funny enough, came to life largely as a result of discussions on the Quadraphonicquad Internet form.

The Surround Master is actually available in two versions. The first runs the developer's proprietary 'Involve' decoding process. It's claimed to work with QS and lesser-known standards like 'Matrix-H'. It will also deliver results from Ambisonic material, matrix-encoded (e.g., Dolby) movies and regular stereo audio. There's two-channel virtual-surround - 'Two Speaker

Surround', or TSS - in addition to 'true' 4.0; the latter mode is also served by 'centre' and 'sub' outputs for 5.1 systems.

This 'standard' model won't alas give optimal results from SQ software, which Involve claims is tricky to decode properly. Hence a version optimised for SQ decoding. Its two modes are a mathematically 'correct' SQ, and a less 'fussy' setting that may perform better with vinyl LPs. It's a shame that quad enthusiasts might need both units – which, labelling apart, look identical.

For five hundred or so Australian dollars you get a power supply, a collection of audio cables and the Surround Master itself, a slim box with a pair of two-position switches (power and mode) on the front, plus a rear-mounted collection of phono sockets. It looks rather cheap, but Involve recently migrated to an enclosure of more attractive design. The electronics – that makes considerable use of digital signal processing – is however identical.

The socketry caters for 2-channel input, and 2/4/5.1 output. All connections are analogue, which could be problematic to recent 'quad converts' reliant on modern AV receivers. The analogue multichannel inputs needed to accept the Surround Master's 4.0/4.1 or 5.1 feed are fast-disappearing from such gear. A HDMI output is thus advised for any second-generation model.

What we have now, though, works very well. That said, an old Matrix-HJ tape of a BBC-broadcast Genesis Knebworth performance was muddled and indistinct; the tape, I suspect, was to blame. A Sight and Sound DVD performance of another prog band, Gentle Giant, fared much better – its Matrix-H soundtrack came directly from the Beeb's archives. The vocals of 'Free Hand' were uncannily assigned to different

speakers, while the positioning of vibraphone, organ and guitars helped to convey a definite sense of space.

Surround Master trounced my vintage Pioneer QX-949 receiver's basic QS/RM decoder when it came to decoding 'Charlie Freak', from Steely Dan's QS-encoded Pretzel Logic LP.

I compared the SQ-encoded Alan Parsons mix of 'Dark Side of the Moon' with a discrete four-channel version and I have to say that the two were very close. 'On the Run' and the clocks at the beginning of 'Time' are particular standouts!

With Carmina Burana (Previn/LSO), though, the effect was more subtle – choral layers were better-defined than they were with the QX949's primitive decoder. In comparison, my considerably-newer Onkyo DSP tended to thicken the sound or add artificial ambience.

The 'standard' Surround Master also provided interesting results with stereo material, extending the soundstage and excavating instruments from the mix. It's surprisingly transparent, insofar that it doesn't alter tonal balance or add appreciable distortion. I certainly prefer it to most of the DSP nodes specified for AV gear.

But the Surround Master's real forte is quad, and it's a 'must' if you have an appreciable number of SQ and QS LPs to play. Ideally a forthcoming version would have HDMI connectivity and sufficient memory to store all Involve DSP software, thereby enabling it to handle everything matrixed.

Involve is also rumoured to be investigating the possibility of a CD-4 demodulator; combine this with the Surround Master functionality and you'd have an awesome unit able to cope with practically anything quad. ●

Golden lights

Gold detailing marks out Final's new flagship Sonorous X headphones as a seriously up-market product. Jon Myles discovers whether the sound matches the design.

Not that many years ago high-end headphones were rather a niche market. But tastes and listening habits change rapidly – so now they've become one of the most rapidly expanding sectors of the hi-fi industry.

For confirmation look no further than Japan's Final (previously known as Final Audio Design). The company originally made its name through producing luxury cartridges, amplifiers and loudspeakers before switching its main focus to headphones – both in and over-ear.

I was rather impressed with Final's Heaven VIIIIs – an in-ear design that combined a distinctive look with very balanced sound.

Now, though, we have the flagship of the company's range with the £3500 Sonorous X over-ear headphones. In traditional Japanese style (where packaging and presentation are an integral part of the product) they are beautifully presented in a fur-lined wooden box with a set of dedicated balanced cables.

The 'phones themselves also look distinctive – constructed from stainless steel and aluminium with gold leaf embellishments on the ear cups. The 50mm

drivers are constructed from titanium while real leather is used for the padding and headband. This contributes to an overall weight of 630g which is rather heavy but the fit and finish is supremely well judged – meaning they never get uncomfortable during long listening sessions.

SOUND QUALITY

The Sonorous Xs need a decent run-in. Straight out of the box they sound rather flabby and ill-defined. After a good few hours, however, they settle down and reveal their true character. Which is warm, rich and expansive.

What they do well is give a very wide soundstage. This is one 'phone that really does give the impression that the sound is coming from well outside your head.

Used with a Chord Hugo TT and the excellent headphone output of a Naim Supernait 2, Ike and Tina Turner's 'River Deep Mountain High' was the sonic equivalent of a wide-screen movie. There was terrific separation to the instruments, they had real weight and the vocals were perfectly pitched.

With something a little gentler in the form of Barb Jungr's 'Stockport To Memphis' (24/96), the Finals did a great job of conveying the smoky club-like jazz atmosphere of the collection, pulling inward the soundstage to provide an intimate listen.

What you don't get is the sort of

In traditional Japanese style the Sonorous X headphones come in a luxurious, fur-lined box which fully reflects their lofty price tag.



forensic, studio-like precision some other headphones at this level can provide. There's no lack of detail – the multi-tracked guitar on The Smiths' 'How Soon Is Now' was well presented – but if you are a fan of searing treble or thunderously low bass then the Sonorous X are probably not for you.

However, if you value refinement and an essentially sophisticated presentation then these headphones will be just the thing. It's actually the sort of sound that helps stretch out listening into the wee small hours – which, coupled with the comfort of the 'phones themselves, is a definite plus.

CONCLUSION

The Sonorous X is a definitely different headphone at this level, having a distinctive sound. It won't appeal to everyone but if you like what it does you are unlikely to find anything to match.

FINAL SONOROUS X £3500



OUTSTANDING - amongst the best

VERDICT

Smooth and refined in both looks and sound. For those who like a rich, sumptuous sound.

FOR

- refined sound
- expansive soundstage
- build quality
- comfort

AGAINST:

- not the most explicit
- price
- weight

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conrad-johnson ET3 valve line preamplifier	£2995	£1999	Avalon Acoustics TIME loudspeaker system	£59995 £POA
conrad-johnson ET3SE valve line preamplifier	£4495	£3195	Avalon Acoustics PRO MIXING MONITOR	£9995 £5999
conrad-johnson ET3SE line/phono preamplifier - review sample	£5990	£3999	Avalon Acoustics SYMBOL loudspeaker system (latest specification)	£4600 £1799
conrad-johnson TEA-2 valve phono preamplifier - review sample	£3490	£2299	Avalon Acoustics STUDIO PRO loudspeaker - review pair	£3700 £1850
conrad-johnson TEA-2MAX valve phono stage - review sample	£7295	£4999		
conrad-johnson Classic 60SE stereo amplifier	£4995	£3499		
conrad-johnson ARTsa stereo amplifier	£19995	£13495	Zanden Audio Systems	
conrad-johnson ARTmono amplifier (pair) - pre-owned	£40000	£24995	Zanden Model 120 Phono Preamplifier	£7495 £5499
conrad-johnson Premier 18LS line FET preamplifier - pre-owned	£4900	£1999	Zanden Model 8120 Stereo Power Amplifier (90W)	£21000 £14999
			Zanden Model 3000 Line Valve Preamplifier - review sample	£14995 £8999
			Zanden Model 2000P CD transport - review sample	£27995 £16995
			Zanden Model 5000MkIV Signature DAC - review sample	£14995 £9995
			Zanden DSC-1 Digital Signal Conditioner	£1000 £499
HiResTech				
HRT STAGE Music System (Black or White) - Complete audio system	£1299	£799		
finite elemente			Magnum Dynalab	
finite elemente pagode Signature Wall - Black wood/Chrome finish	£2300	£1299	Magnum Dynalab MD809T Valve Internet Tuner	£7995 £5999
finite elemente pagode HD02MR Edition HD - Maple/Chrome finish	£6950	£3490	Magnum Dynalab MD807T Valve Internet Tuner - review sample	£4000 £2899
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finite elemente pagode HD09MR EDITION "Q" - Left/Right use	£1700	£1150	Magnum Dynalab MD801 Internet Media Tuner	£1500 £1150
finite elemente HD09MR Edition "L" Version - review sample	£1700	£999	Magnum Dynalab MD105T/DAC FM Valve Tuner - pre-owned	£4299 £2499
			Magnum Dynalab MD108 FM Valve Tuner - Pre-owned	£6500 £2999
			Magnum Dynalab MD108T Signature FM valve tuner	£8495 £6899
			Magnum Dynalab MD108T FM Valve Tuner	£6995 £5499
			Magnum Dynalab MD107T FM Valve Tuner	£4500 £3499
			Magnum Dynalab MD105 FM Tuner	£2700 £2149
			Magnum Dynalab MD90T SE FM Valve Tuner	£2000 £1600
			Magnum Dynalab MD90T FM Valve Tuner	£1500 £1150
			Magnum Dynalab MD90SE FM Tuner	£1500 £1150
			Magnum Dynalab MD90 FM Tuner	£1150 £975
			Magnum Dynalab MD306 Integrated Amplifier - 2x125W	£4500 £1899
Kuzma			Rogue Audio	
Kuzma Stabi XL4 turntable (black) - review sample	£22495	£13995	Rogue Audio Stealth Phono MM/MC Preamplifier	£900 £399
Kuzma 4Point tonearm - review sample	£4995	£4250	Rogue Audio Triton Phono MM/MC Preamplifier - Silver finish	£999 £499
Kuzma Stabi M turntable - review sample	£13995	£11995	Rogue Audio Sphinx Hybrid Integrated Amplifier	£1590 £999
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BENZ-MICRO LP-S mc phono cartridge (0.34mV)	£2999	£2299		
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BENZ-MICRO GLIDER SL mc phono cartridge (0.4mV)	£799	£649		
BENZ-MICRO GLIDER SM mc phono cartridge (0.8mV)	£799	£649		
BENZ MICRO GLIDER SH mc phono cartridge (2.5mV)	£799	£649		
BENZ-MICRO ACE SL mc phono cartridge (0.4mV)	£599	£499		
BENZ-MICRO ACE SM mc phono cartridge (0.8mV)	£599	£499		
BENZ-MICRO ACE SH mc phono cartridge (2.5mV)	£599	£499		
BENZ-MICRO MC GOLD mc phono cartridge (0.4mV)	£270	£229		
BENZ-MICRO MC SILVER mc phono cartridge (2mV)	£270	£229		
Karan Acoustics				
Karan Acoustics KA L REF Mk3 Line/Phono Pre (silver finish)	£12700	£6999		
Karan Acoustics Phono Reference preamplifier (silver finish)	£15000	£10495		
Karan Acoustics PH1 phono preamplifier (silver finish)	£7900	£5490		
Karan Acoustics KA S 180Mk2 stereo amplifier - review sample	£5995	£3495		
Karan Acoustics KA I 180Mk2 integrated amplifier (black finish)	£6995	£4999		
Karan Acoustics KA M 650 mono amplifier (pair) - in-house pair	£18000	£7900		
Karan Acoustics KA M 2000 mono amplifier (pair) - (black finish)	£44995	£POA	E. & O. E.	

December 2015

Lab Innovation



Jon Myles says Audiolab's latest integrated amplifier takes a design classic to new heights.

Audiolab has enjoyed a renaissance since becoming part of China's giant IAG group just over a decade ago. Innovative products such as the M-DAC and Q-DAC digital-to-analogue converters have become a benchmark for quality at their price points, while the 8200CDQ was a ground-breaking CD player – only recently replaced by the upgraded 8300CD (see review *Hi-Fi World* December 2015).

But the brand initially built its reputation with amplifiers, specifically the 8000A. This was a slim integrated that combined solid, punchy sound with fine build and ergonomics, yet still sold at a realistic price. For many it was the natural next step up from budget models – becoming one of the most successful British amps ever.

The original design has undergone multiple revisions since then, as Audiolab passed to the TAG (Techniques D'Avant Garde) group of companies, sitting alongside luxury watches, fast cars and business jets in what sounds like a men's magazine's contents list, before being brought into the IAG fold alongside Quad, Castle, Wharfedale and Mission.

Now Audiolab has unveiled the latest spiritual successor to the

8000A in the shape of the 8300A integrated, priced at £899.95. The company says the new Audiolab stays true to the original's ethos of simplicity of operation allied to crisp, transparent sound – but utilises current thinking in electronic technology and design to create a thoroughly innovative product.

So looks-wise it's classic Audiolab with a slim case – 80mm x 444mm x 330mm (H/W/D) and a clean, uncluttered fascia featuring three rotary controls for volume, source and mode selection with a large, easy-to-read display in the centre.

Inside the 8300A is a dual-mono arrangement, powered by a 300VA toroidal transformer with 60,000 uF of reservoir capacitance, giving a claimed 75 Watts per channel output into 8 Ohms (see Measured Performance for our comprehensive test figures).

On the rear there are five line-level inputs as well as balanced XLR plus an MM/MC phono with adjustable gain settings. The pre and power sections can also be separated to allow upgrades such as adding a better preamp or more muscular power amplifier. There's also two sets of 'speaker posts to make bi-wiring easier.

Build quality is up there with

the best at this price with a blasted aluminium finish (silver or black) and CNC machined control dials which feel sturdy and have a nice, smooth action.

There's no DAC option, though, presumably because Audiolab would prefer you to use its matching 8300CD (32bit/384kHz and DSD capable) player for this purpose.

SOUND QUALITY

Audiolab says the new 8300A is balanced throughout – so I connected it to our resident Oppo BDP-105D for both CD playback and high-resolution streaming via a pair of Chord's excellent Tuned ARAY XLR interconnects.

Feeding it Keith Jarrett's 'The Koln Concert' the first thing I was struck by is just how evenly balanced this amplifier sounds, seeming to add little colour to the sound. Jarrett's insistent ostinatos were superbly pitched and the amplifier handled sudden switches between gentler and more up-tempo passages with confidence.

That's a sign that it's pretty light on its feet – which it is – but underlying that there's muscularity to the sound. It's a quality that was encapsulated on Bjork's 'Black Lake', which combines the Icelandic singer's

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Stereo, Mono & 78 rpm Artisan Noriyuki Miyajima has been making phono cartridges in Japan for more than three decades. Only recently discovered by American and European audiophiles, they have since received rave reviews all over the world and deservedly so.

Every Miyajima cartridge is handcrafted in-house by a dedicated full-time team of six based in Fukuoka. The cartridge bodies are individually precision-milled from rare and exotic hardwoods including ebony, rosewood and African blackwood (mpingo). These dense natural materials lend a vibrant and natural tonality to the sound.

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The remote control supplied with the **Phono Signature** enables you to finely adjust gain and cartridge loading for MC cartridges from your listening chair.

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distinctive, breathy vocals with some serious low frequencies. Both were very much in evidence through the 8300A – with the bass sounding tight, powerful and controlled, so providing a firm but not over-intrusive foundation for the midband and treble. I could hear the layers in the music and catch the emotion as the song built to its climax.

It was a very nuanced presentation. The Audiolab didn't grab my attention with outright slam or an in-the-face delivery, but the longer I listened the more I realised it was inherently right.

On Daft Punk's 'Random Access Memories' (24bit/88.1kHz) through a pair of Quad S2 standmounts it had a wide and involving soundstage, plus enough grip to get these little 'speakers singing. It's a pairing costing around £1600 without source – but playing 'Get Lucky' through this combination showed it's a potent partnership with detail, clarity and a top to bottom sense of realism.

Substituting the Quads for a set of Quadral Chromium Style 8 floorstanders (see review next issue) showed the 8300A has the ability to bring the best out of more expensive transducers. The Quadras are fairly neutral and that sits well with the Audiolab's inherently natural sound



Two sets of speaker outputs (unswitched) facilitate bi-wiring. Balanced XLR line inputs complement phono sockets inputs.

– meaning you get to hear just what your source is doing.

So on Led Zeppelin's 'Dazed and Confused' (24/96 FLAC file) the leading edges of notes on Jimmy Page's guitar riff had great definition and seemed to stop and start with total accuracy.

A big, wide soundstage never became diffuse, placing instruments in a fixed, believable position.

In absolute terms there's perhaps not the outright drive of something like a Naim Nait 5si or, say, an Exposure 3010S2D, both of which are more rhythmically propulsive. But, by contrast, the Audiolab sounds a little more clean and open. There's no right or wrong here – just a matter of which presentation you prefer in your system.

The phono section is also no mere afterthought, working well with both MM and MC cartridges. Again, it's nicely even and balanced with a good sense of detail retrieval

and a rather smooth tonality. No, it won't compete with a good £600 standalone phono amp but in the context of a £900 amplifier it was very impressive.

Which is a good description of the overall performance of the Audiolab 8300A. It's an open, revealing amplifier with a sophisticated sound and enough power to drive even demanding loudspeakers.

Add in its ease of use, build quality and additional features such as the MM/MC phono stage and it makes a very impressive case for itself. It's one of the best you can find at this price level.



The remote switches between MC and MM cartridges, via the single Phono input.

CONCLUSION

Anyone looking for a fully-featured integrated amplifier for less than £1000 simply has to put the Audiolab 8300A at the top of their list. It has power, poise and precision in equal measure and is a joy to listen to. Highly recommended.

MEASURED PERFORMANCE

The Audiolab 8300A produced 78 Watts into 8 Ohms and 126 Watts into 4 Ohms; since most loudspeakers are 6 Ohms nominal impedance nowadays it can be seen as a 100 Watt amplifier. This is plenty powerful enough to drive all loudspeakers to very high volume in even a large room.

Distortion levels were minimal, around 0.003% in the midband and 0.02% at high frequencies (10kHz), with no crossover distortion; our distortion analysis shows just second harmonic at 1Watt output into 4 Ohms at 10kHz – a test that reveals crossover.

The balanced XLR input had 700mV sensitivity – on the low side but bear in mind that a CD player or Universal player like the Oppo BDP-105D produce 4V at their XLR outputs so the Audiolab is still sensitive enough. The phono-socket line inputs measured out at 350mV sensitivity.

Frequency response was flat and wide, reaching 73kHz through the XLR input.

The 8300A's phono stage was enormously sensitive, needing just 1.3mV

from MM and a minuscule 0.13mV from MC for full output, making the lowest output MCs compatible. Noise was extremely low at 0.06µV equivalent input noise (A wttd) and overload satisfactory at 40mV for MM and 4mV for MC. RIAA equalisation was accurate, meaning flat frequency response in effect, for both MM and MC, a warp filter rolling down gain below 20Hz to provide some attenuation (-7dB) at 5Hz.

The Audiolab 8300A measured very well all round, having a superb phono stage in particular, compatible with the lowest output MC cartridges, as well as the highest output MMs. **NK**

Power 78watts

CD/tuner/aux.

Frequency response 2Hz-73kHz

Separation 88dB

Noise -104dB

Distortion 0.02%

Sensitivity (phono/XLR) 350/700mV

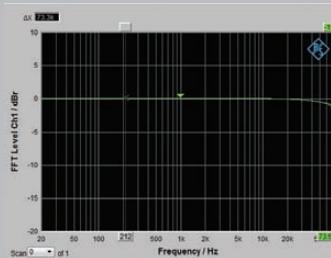
Disc

Frequency response 20Hz-20kHz

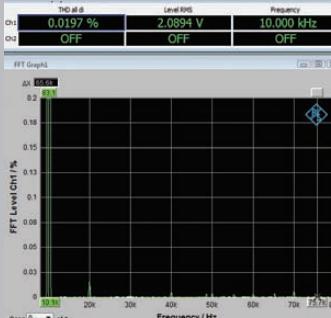
Separation 68dB

Noise	-85dB
Distortion	0.01%
Sensitivity	0.13/1.3mV
Overload	4/40mV

FREQUENCY RESPONSE



DISTORTION



AUDIOLAB 8300A £899.95



OUTSTANDING - amongst the best.

VALUE - keenly priced.

VERDICT

A cracking amplifier from Audiolab that has a sound quality that belies its price. Could show a thing or two to amplifiers costing a great deal more.

FOR

- detailed, open sound
- wide soundstage
- deep bass
- MM/MC phono stage

AGAINST

- nothing at the price

Audiolab
+44 (0) 1480 447700
www.audiolab.co.uk



We do not sell these products. It is for your information only.

WORLD CLASSICS

Here is our list of the great and good from audio's glorious past, products that have earned their place in hi-fi history. You'll also see some oddities which aren't classic as such, but are great used buys. The year of introduction is given, alongside the original UK launch price.

TURNTABLES

EAT FORTE 2009 £12,500
Lavishly finished two box, two motor turntable with gorgeous Ikeda 407 tonearm bundled. Exceptionally stable and unfussy performer with a relaxed but highly enjoyable gait.



FUNK FIRM VECTOR II 2009 £860
Innovative engineering gives a nimble, pacy and musical sound that's one of the best at the price.

REGA P2 2008 £300
Excellent value for money engineering, easy set up and fine sound.

MCINTOSH MT10 2008 £8,995
Big, expensive, controversially styled and glows more than some might consider necessary, but an astonishingly good performer.

REGA P3-24 2008 £405
Seminal affordable audiophile deck with fine bundled tonearm. Tweakable, and really sings with optional £150 outboard power supply.

ACOUSTIC SOLID ONE 2007 £4,050
Huge turntable, both in terms of sheer mass and sonic dynamics. Fit up to three arms and enjoy, just don't damage your back moving it...

AVID VOLVERE SEQUEL 2007 £4,600
Stylish high end vinyl spinner with industrial strength build quality and a sound to match. Sound is edge-of-the-seat stuff.

MICHELL GYRODEC SE 2005 £1,115
Design icon with superlative build. Sound is beautifully smooth, effortless and exceptionally expansive.

MARANTZ TT-15S1 2005 £1,299
Cracking all in one deck/arm/cartridge combination, this must surely be the best sound'plug and play package at this price point.

MICHELL TECNODEC 2003 £579
Superb introduction to Michell turntables - on a budget. Top quality build and elegant design mean it's still the class of the mid-price field.



MICHELL ORBE 1995 £2,500
The top Michell disc spinner remains a superbly capable all rounder with powerful, spacious sound that's delicate and beguiling.

SME MODEL 10A 1995 £4,700
Exquisitely engineered deck and SME V tonearm combo that's an extremely accomplished performer with classical music.

LINN AXIS 1987 £253
Cut-price version of the Sondek with LVX arm. Elegant and decently performing package. Later version with Akito tonearm better.

TECHNICS SL-P1200 1987 £800
CD version of the Technics SL-1200 turntable. Massively built to withstand the rigours of 'pr' use and laden with facilities - a great eighties icon.

ROKSAN XERXES 1984 £550
Super tight and clean sound, with excellent transients. Less musical than the Sondek, but more neutral. Sagging plinth top-plates make them a dubious used buy.

DUAL CS505 1982 £75
Simple high quality engineering and a respectable low mass tonearm made for a brilliant budget buy. Polished, smooth and slightly bland sound.

MICHELL GYRODEC 1981 £599
Thanks to its stunning visuals, this bold design wasn't accorded the respect it deserved. Clean, solid and architectural sound.

TOWNSHEND ROCK 1979 £N/A
Novel machine has extremely clean and fluid sound. Substantially modified through the years, and capable of superb results even today.

MARANTZ TT1000 1978 £N/A
Beautiful seventies high end belt drive with sweet and clean sound. Rare in Europe, but big in Japan.



REGA PLANAR 3 1978 £79
Brilliantly simple but clean and musical performer, complete with Acos-derived S-shaped tonearm. 1983 saw the arrival of the RB300, which added detail at the expense of warmth. Superb budget buy.

SONY PS-B80 1978 £800
First outing for Sony's impressive 'Biotracer' electronic tonearm. Built like a tank with a clean and tidy sound, albeit lacking involvement. Scarily complicated and with no spares support - buy with caution!

TRIO LO-7D 1978 £600
The best 'all-in-one' turntable package ever made, Clean, powerful and three-dimensional sound, ultimately limited by the tonearm.

ADC ACCUTRAC 4000 1976 £300
Bonkers 1970s direct drive that uses an infra red beam to allow track selection and programming. More of a visual and operational delight than a sonic stunner.

PIONEER PLC-590 1976 £600
Sturdy and competent motor unit that performs well with a wide range of tonearms. Check very thoroughly before buying due to electronic complexity and use of some now-obsolete ICs.

PIONEER PL12D 1973 £36
When vinyl was the leading source, this bought new standards of noise performance and stability to the class, plus a low friction S-shaped tonearm. Later PL112D was off the pace compared to rivals.



TECHNICS SP10 1973 £400
Seminal Japanese engineering. Sonics depend on plinths, but a well mounted SP10/II will give any modern a hard time, especially in respect of bass power and midband accuracy.

LINN SONDEK LP12 1973 £86
For many, the Brit superdeck; constant mods meant that early ones sound warmer and more lyrical than modern versions. Recent 'SE' mods have brought it into the 21st century, albeit at a price.

ARISTON RD11S 1972 £94
Modern evolution of Thorens' original belt drive paradigm, Scotland's original super-deck was warm and musical, albeit soft. Still capable of fine results today.

GOLDRING LENCO GL75 1970 £15.63
Simple, well engineered motor unit with soft, sweet sound and reasonable tonearm. Good spares and servicing support even today.

GARRARD 301/401 1953 £19
Tremendously strong and articulate with only a veiled treble to let it down.



THORENS TD124 1959 £ N/A
The template for virtually every 1970s 'superdeck', this iconic design was the only real competition for Garrard's 301. It was sweeter and more lyrical, yet lighter and less impactful in the bass

TONEARMS

REGA RB251 2009 £136
Capable way past its price point, the new 3-point mount version of the classic RB250 serves up a taut and detailed sound. A little lean for some tastes, but responds well to rewiring and counter-weight modification.

HELIUS OMEGA 2008 £1,595
Stylish and solid lump of arm with fabulous build quality, that turns in a dynamic and weighty performance.

AUDIO ORIGAMI PU7 2007 £1,300
The classic Syrinx PU3 updated to spectacular effect. Hand made to order, with any mass, length and colour you care for. Fit, finish and sound truly impressive.



GRAHAM PHANTOM 2006 £3,160
Sonically stunning arm with magnificent bass dexterity and soundstaging. Build quality up to SME standards, which is really saying something!

TRI-PLANAR PRECISION 2006 £3,600
Immaculate build, exquisite design and one of the most naturally musical and lucid sounds around.

MICHELL TECNOARM A 2003 £442
Clever reworking of the Rega theme, using blasting, drilling and rewiring!

SME 309 1989 £767
Mid-price SME comes complete with cost-cut aluminium arm tube and detachable headshell. Tight, neutral sound with good tonality, but lacks the IV's pace and precision.

NAIM ARO 1987 £1,425
Charismatic unipivot is poor at frequency extremes but sublime in the midband; truly emotive and insightful.

SME SERIES V 1987 £2,390
Vice-like bass with incredible weight, ultra clear midband and treble astound, although some don't like its matter of factness!

NAIM ARO 1986 £875
Truly endearing and charismatic performer - wonderfully engaging mid-band makes up for softened frequency extremes.



ALPHASON HR100S 1981 £150
First class arm, practically up to present-day standards. Buy carefully, though, as there is no service available now. Totally under priced when new, exceptional.

SME SERIES III 1979 £113
Clever variable mass design complete with Titanium Nitride tube tried to be all things to all men, and failed. Charming nonetheless, with a warm and inoffensive sound.

TECHNICS EPA-501 1979 £ N/A
Popular partner for late seventies Technics motor units. Nice build and Titanium Nitride tube can't compensate for middling sound.

LINN ITOK LVII 1978 £253
Japanese design to Linn specs made for a muscular, rhythmic sound with real dynamics. The final LVIII version worth seeking out.

AUDIO TECHNICA AT 1120 1978 £75
Fine finish can't compensate for this ultra low mass arm's limited sonics - a good starter arm if you've only got a few quid to spend.

HADCOCK GH228 1976 £46
Evergreen unipivot with lovely sweet, fluid sound. Excellent service backup.

ACOS LUSTRE GST-1 1975 £46
The archetypal S-shaped seventies arm; good, propulsive and involving sound in its day, but ragged and undynamic now.

SME 309 1959 £18
Once state of the art, but long since bettered. Musical enough, but weak at frequency extremes and veiled in the midband. Legendary serviceability and stunning build has made it a cult, used prices unjustifiably high.

PHONO STAGES

CREEK OBH-8 SE 1996 £180
Punchy, rhythmic character with oodles of detail makes this a great budget audiophile classic. Partner with a Goldring G1042 for an unbeatable budget combination.

MICHELL ISO 1988 £ N/A
This Tom Evans-designed black box started the trend for high performance offboard phono stages. Charismatic, musical and punchy - if lacking in finesse.



LINN LINNK 1984 £149
Naim-designed MC phono stage built to partner the original Naim NAIT - yes, really! Fine sound, although off the pace these days.

INTEGRATED AMPLIFIERS

NAIM NAIT XS 2009 £1,250
With much of the sound of the Supernait at half the price, this is powerful, articulate and smooth beyond class expectations.

MUSICAL FIDELITY PRIMO 2009 £7,900
Seriously expensive, but one listen explains why. Wonderfully exuberant sound that can only come from a top quality tube design.

SUGDEN A21A S2 2008 £1,469
Crystalline clarity, dizzying speed and forensic detailing. Power limited so needs sensitive speakers.

CREEK OBH-22 2008 £350
Brilliant value budget passive, with remote control, mute and input switching, plus an easy, a neutral sound.

CAMBRIDGE 840A V2 2007 £750
Version 2 addresses version 1's weaknesses to turn in a mightily accomplished performance, offering power, finesse and detail.

SUGDEN IA4 2007 £3,650
Goodly amount of Class A power, icy clarity and a breathtakingly fast, musical sound make this one of the very best super-integrateds.

NUFORCE P-9 2007 £2,200
Impressive two box preamp with superb resolution and an engaging sound.

MELODY PURE BLACK 101D 2007 £3,295
The clarity and openness of valves plus firm grip and fine detail make this a preamplifier masterclass.

AUDIOLAB 8000S 2006 £400
In another life, this sold for three times the price, making it a stand-out bargain now. Very clean, powerful and tidy sound.

MCINTOSH MA6800 1995 £3735
Effortlessly sweet, strong and powerful with semi-natural styling to match.

DELTEC 1987 £1900
Fast, dry and with excellent transients, this first DPA integrated is the real deal for eighties obsessives. Ridiculously punchy 80W per channel from a tiny, half-size box. Radical, cool and more than a little strange.

EXPOSURE VII/VIII 1985 £625
Seminal pre-power, offering most of what Naim amps did with just that little bit extra smoothness. Lean, punchy and musical.



AUDIOLAB 8000A 1985 £495
Smooth integrated with clean MM/MC phono stage and huge feature count. Extremely reliable, too. Post '93 versions a top used buy.

VTL MINIMAL/50W MONOBLOCK 1985 £1,300
Rugged, professional build and finish allied to a lively and punchy sound (albeit with limited power) make them an excellent used buy.

MUSICAL FIDELITY A1 1985 £350
Beguiling Class A integrated with exquisite styling. Questionable reliability.

MISSION CYRUS 2 1984 £299
Classic 1980s minimalism combines arresting styling with clean, open, lively sound. Further upgradeable with PSX power supply.



NAIM NAIT 1984 £350
Superb rhythms and dynamics make it truly musical, but tonally monochromatic. Fine phono stage, very low power.

CREEK CAS4040 1983 £150
More musical than any budget amp before it; CAS4140 loses tone controls, gains grip

MYST TMA3 1983 £300
Madcap eighties minimalism, but a strong and tight performer all the same.

ROTEL RA-820BX 1983 £139
Lively and clean budget integrated that arguably started the move to minimalism.

NAD 3020 1979 £69
Brilliantly smooth, sweet and punchy at the price and even has a better phono stage than you'd expect. The archetypal budget super-amp.

ROGERS A75 1978 £220
Lots of sensible facilities, a goodly power output and nice sound in one box. The later A75II and A100 versions offered improved sonics and were seriously sweet.

A&R A60 1977 £115
Sweet and musical feature-packed integrated; the Audiolab 8000A remains a classic.



SUGDEN C51/P51 1976 £130
Soft sounding early Sugden combo with a plethora of facilities and filters. A sweet and endearing performer but lacking in power and poor load driving ability.

SUGDEN A21 1969 £ N/A
Class A transistor integrated with an eminently likeable smoothness and musicality. Limited inputs via DIN sockets.

ROGERS CADET III 1965 £34
Sweet sounding valve integrated, uses ECL86 output valves, even has a half useable phono stage, sweet, warm a good introduction to valves

CHAPMAN 305 1960 £40
Smooth pre/power combo with a sweet and open sound. Not quite up to Leak/Quad standards but considerably cheaper secondhand.

POWER AMPLIFIERS
ELECTROCOMPANIET NEMO 2009 £4,995 (EACH)

Norwegian power station as cool as a glacier tonally, yet impresses with sheer physicality and fleetness of foot. 600W per channel.

NUFORCE REFERENCE 9SE V2 2006 £1,750
Brilliant value for money monoblocks with massive power and super-clean, three dimensional sound.

QUAD II-80 2005 £6,000 PER PAIR
Quad's best ever power amplifier. Dramatic performer with silky but dark tonality, blistering dynamics, serious power and compellingly musical sound.



QUAD 909 2001 £900
Current-dumper has a smooth and expansive character with enough wallop to drive most loads. Not the most musical, but superb value all the same.

NAIM NAP 500 2000 £17,950
Flagship amplifier will drive just about any speaker with ease. Factor in the company's trademark pace, rhythm and timing and it all adds up to one effortlessly musical package.

MARANTZ MODEL 9 1997 £8000
Authentic reproduction monoblocks still more than cut the sonic mustard. Highly expensive and highly sought after.

MICHELL ALECTO 1997 £1989
Crisp, clean and beautifully controlled with gorgeous styling. Partnered with the £1650 Orca this sounds delicious!



MUSICAL FIDELITY XA200 1996 £1000
200W of sweet smooth transistor stomp in a grooved tube! Under-rated oddity.

PIONEER M-73 1988 £1,200
Monster stomp from this seminal Japanese power amplifier, complete with switchable Class A and Class B operation. Clean, open and assured sounding, albeit a tad behind the pace on high speed dance music. Rosewood side cheeks and black brushed aluminium completes the experience.

KRELL KMA100 II 1987 £5,750
Monoblock version of the giant KSA-100 is one of the seminal 80s transistor power amplifiers. Massive wallop allied to clean and open Class A sound makes this one of the best amplifiers of its type.

RADFORD STA25 RENAISSANCE 1986 £977
This reworking of Radford's original late sixties design was possessed of a wonderfully rich, old school valve sound with enough power (25W) and lots of subtlety.

QUAD 405 1978 £115
The first of the current dumpers is a capable design with smooth, effortless power and a decently musical sound. 606 and 707 continue the theme with greater detail and incision.

HH ELECTRONICS TPA-50D AMPLIFIERS 1973 £110
Simple design with easily available components, solid build quality and fine sound make for a surprisingly overlooked bargain

LECSION AP1 1973 £ N/A
Madcap cylindrical styling alluded to its 'tower of power' pretensions, but it wasn't. Poor build, but decently clean sounding when working.

QUAD 303 1968 £55
Bullet proof build, but woolly sound. Off the pace, but endearing nonetheless. Some pipe smoking slipper wearers swear by them!

LEAK STEREO 20 1958 £31
Excellent workaday classic valve amplifier with decent power and drive. Surprisingly modern sounding if rebuilt sympathetically. Irrepressibly musical and fluid.



LEAK STEREO 60 1958 £ N/A
Leak's biggest valve power amp offers 35 Watts per channel and more low end welly than the smaller Stereo 20. Despite concerns over reliability rarity value means high price.

QUAD II 1952 £22
The all-time classic valve amplifier, with a deliciously fluid and lyrical voice. In other respects though, it sounds hopelessly dated. Low power and hard to partner properly



LEAK POINT ONE, TL10, TL12.1, TL12 PLUS 1949 £28
Early classics that are getting expensive. Overhauling is de rigueur before use, using original parts if possible. Surprisingly crisp and musical. Deeply impressive in fine fettle.

PRE AMPLIFIERS

AUDIOLAB 8000C 1991 £499
Tonally grey but fine phono input and great facilities make it an excellent general purpose tool.



CROFT MICRO 1986 £150
Budget valve pre-amp with exceptionally transparent performance.

CONRAD JOHNSON MOTIV MC-8 1986 £2,500
Minimalist FET-based preamplifier is brilliantly neutral and smooth with a spry, light balance in the mould of Sugden. Something of a curio, but worthwhile nonetheless.

AUDIO RESEARCH SP-8 1982 £1,400
Beautifully designed and built high end tube pre-amplifier with deliciously sweet and smooth sound. Not the last word in incision or grip.

LINN LK-1 1986 £499
A brave attempt to bring remote controlled user-friendliness to hair-shirt audiophile hi-fi. Didn't quite work, but not bad for under £100.

NAIM NAC 32.5 1978 £ N/A
Classic high end pre. Brilliantly fast and incisive sound that's a joy with vinyl but a tad forward for digital.

LECSION AC-1 1973 £ N/A
Amazing styling courtesy of Allan Boothroyd can't disguise its rather cloudy sound, but a design classic nonetheless.

QUAD 33 1968 £43
Better than the 22, but Quad's first tranny pre isn't outstanding. Responds well to tweaking/rebuilding though...



LEAK POINT ONE STEREO 1958 £ N/A
Good for their time, but way off the pace these days. Use of EF86 pentode valve for high gain rules out ultra performance. Not the highest-fi!

QUAD 22 1958 £25
The partner to the much vaunted Quad II monoblocks - cloudy and vague sound means it's for anacrophiles only.

LOUDSPEAKERS

WHARFEDALE DIAMOND 10.3 2010 £290
Great small standmounters for audiophiles on a budget; dry punchy sound with impressive soundstaging at the price.



YAMAHA SOAVO 1.1 2009 £3,000
Musical, transparent with impressive dynamics and cohesion. Excellent build and finish.

USHER BE-10 2009 £10,500
Clever high end moving coil design with immense speed and dizzying clarity allied to epic punch. Needs the best ancillaries to fly, though...



SPENDOR A5 2009 £1,695
Multi-talented floorstanders with generous scale and punch and Spendor's classic mid-range detail. Deliver a sound that thoroughly engages whatever you care to play.

MONITOR AUDIO PL100 2008 £2,300
The flagship 'Platinum' series standmounter has a lovely warm and delicate sound with superlative treble.



MARTIN LOGAN SOURCE 2008 £1,600
Brilliant entry level electrostatics, giving a taste of loudspeaker esoterica for the price of most moving coil boxes. Tremendous clarity, evenness and delicacy, although not the world's most powerful sound.

PMC OB11 2008 £2,950
Cleverly updated floorstanders give scale and solidity in slim and well finished package.

ISOPHON GALILEO 2007 £2,100
Big standmounters that really grip the music and offer quite startling dynamics and grip.

ONE THING AUDIO ESL57 2007 £1,450
One Thing Audio's modifications keep the good old ESL57 at the very top of the game.

MOWGAN AUDIO MABON 2007 £3,995
Massively capable loudspeakers that offer dynamics, scale and clarity in an elegantly simple package. Wide range of finishes, too.

B&O BEOLAB 9 2007 £5,000
Technically impressive and visually striking loudspeakers with sound quality that more than matches their looks.



ISOPHON CASSIANO 2007 £12,900
Drive units featuring exotic materials allied to superlative build quality result in an immensely capable loudspeaker. Not an easy load to drive, however.

B&W 686 2007 £299
Baby standmounters offer a sophisticated and mature performance that belies both their dimensions and price tag.

QUAD ESL-2905 2006 £5,995
The old 989 with all the bugs taken out, this gives a brilliantly neutral and open sound like only a top electrostatic can; still not a natural rock loudspeaker, though.

B&W 801D 2006 £10,500
In many respects, the ultimate studio monitor; dazzling clarity and speed with commanding scale and dynamics.



REVOLVER CYGNIS 2006 £5,999
Revolver pull out all the stops and show what they can do with this magnificent flagship loudspeaker. A superb monitor that is like a mini B&W 801D in many ways.

USHER BE-718 2007 £1,600
Beryllium tweeters work superbly, allied to a fast and punchy bass driver. The result is subtle, smooth and emotive.

USHER S-520 2006 £350
Astonishingly capable budget standmounters that offer detail and dynamics well beyond their price and dimensions.

ACOUSTIC ENERGY AE1 CLASSIC 2006 £845
Brilliantly successful remake of an iconic design; not flawless, but surely one of the most musical loudspeakers ever made.



MISSION X-SPACE 1999 £499
The first mass production sub and sat system using NXT panels is a sure-fire future classic - not flawless, but a tantalisingly unboxy sound nevertheless!

MISSION 752 1995 £495
Cracking Henry Azima-designed floorstanders combined HDA drive units and metal dome tweeters with surprisingly warm results. Benign load characteristics makes them great for valves.

TANNOY WESTMINSTER 1985 £4500
Folded horn monsters which sound good if you have the space. Not the last word in tautness but can drive large rooms and image like few others.



CELESTION SL6 1984 £350
Smallish two way design complete with aluminium dome tweeter and plastic mid-bass unit set the blueprint for nineteen eighties loudspeakers. Very open and clean sounding, albeit coarse at high frequencies and limp in the bass. Speakers would never be the same again...

HEYBROOK HB1 1982 £130
Peter Comeau-designed standmounters with an amazingly lyrical yet decently refined sound. Good enough to partner with very high end ancillaries, yet great with budget kit too. A classic



QUAD ESL63 1980 £1200
An update of the ESL57, with stiffer cabinets. Until the 989, the best of the Quad electrostatics.

MISSION 770 1980 £375
Back in its day, it was an innovative product and one of the first of the polypropylene designs. Warm, smooth, clean and powerful sound,

ACOUSTIC RESEARCH AR18S 1978 £125
Yank designed, British built loudspeaker became a budget staple for many rock fans, thanks to the great speed from the paper drivers, although finesse was most definitely not their forte...

YAMAHA NS1000 1977 £532
High tech Beryllium midband and tweeter domes and brushtech 12" woofers in massive sealed mirror image cabs equals stunning transients, speed and wallop allied to superb transparency and ultra low distortion. Partner carefully!



JR 149 1977 £120
Cylindrical speaker was ignored for decades but now back in fashion! Based on classic KEF T27/B110 combo as seen in the BBC LS3/5a. Doesn't play loud, needs a powerful transistor amplifier, but has clarity and imaging,

KEF R105 1977 £785
Three way Bextrene-based floorstander gave a truly wideband listen and massive (500W) power handling. A very neutral, spacious and polite sounding design, but rhythmically well off the pace.

SPENDOR BC1 1976 £240
Celestion HF1300 tweeter meets bespoke Spendor Bextreme mid-bass unit. The result is a beautifully warm yet focussed sound. A little bass bloom necessitates careful low-stand mounting.



IMF TLS80 1976 £550
Warm and powerful 1970s behemoth with transmission loading and a mixture of KEF and Celestion drive units. Impressively physical wideband sound but rhythms not a forte.

HH ELECTRONICS TPA-50D AMPLIFIERS

1973 £110
Simple design with easily available components, solid build quality and fine sound make for a surprisingly overlooked bargain. Not exactly stylish, however.

BBC LS3/5A 1972 £88
Extremely low colouration design is amazing in some respects – articulation, stage depth, clarity – and useless in others (both frequency extremes). Came in wide variety of guises from various manufacturers building it under licence.

LEAK SANDWICH 1961 £39 EACH
Warm sounding infinite baffle that, with a reasonably powerful amplifier can sound quite satisfying.

QUAD ESL57 1956 £45 EACH
Wonderfully open and neutral sound puts box loudspeakers to shame. Properly serviced they give superb midband performance, although frequency extremes less impressive. Ideally, use in stacked pairs or with subwoofers and supertweeters.

SYSTEMS

MERIDIAN SOOLOS 2.1 2010 £6,990
Crisp styling, bright, colourful touchscreen, plus excellent search facilities. This is one hard disk music system with a difference. Best partnered to Meridian active loudspeakers.



NAIM UNITIQUE 2010 £995
Great little half width one-box system with truly impressive sound allied to a wealth of source options.

ARCAM SOLO MINI 2008 £650
Half the size and two-thirds the price of a full-sized Solo, the Mini gives very little away in terms of performance to its bigger brother.

MERIDIAN F80 2007 £1,500
Fantastically built and versatile DVD/CD/DAB/FM/AM unit, designed in conjunction with Ferrari. Ignore nay-sayers who sneer that it isn't a 'proper' hi-fi product. Just listen.

SHANLING MC-30 2007 £650
Quite possibly the cutest all-in-one around with fine performance from the CD player, tuner and MP3 player input. Very low power, though.



AURA NOTE PREMIER 2007 £1,500
Lovely shiny CD/tuner/amplifier with fine sound quality and dynamic abilities.



MARANTZ 'LEGEND' 2007 £22,000
The combination of SA-7S1 disc player, SC-7S2 preamp and MA-9S2 monoblocks delivers jaw-dropping performance.

ARCAM SOLO NEO 2006 £1,100
Excellent all-in-one system, with a warm, smooth and balanced sound to match the features and style.

PEACHTREE AUDIO IDECCO £1,000
Excellent sounding iPod dock, impressive DAC and fine amplifier section make this an excellent one box style system.



TUNERS

ARCAM FMJ T32 2009 £600
Excellent hybrid FM/DAB+ tuner with a smooth, engaging sound. Factor in its fine build and it's a super value package.



MAGNUM DYNALAB MD-100T 2006 £1,895
One of the best ways to hear FM that we know; superbly open and musical sound in a quirky but characterful package.

MYRYAD MXT4000 2005 £1,000
Sumptuous sound and top-notch build quality make for a tempting AM/FM package. Warm and richly detailed on good-quality music broadcasts.

NAIM NATO3 1993 £595
The warm, atmospheric sound is further proof of Naim's proficiency with tuners.

CREEK CAS3140 1985 £199
Excellent detail, separation and dynamics - brilliantly musical at the price. T40 continued the theme...

QUAD FM4 1983 £240
Supreme ergonomics allied to a pleasingly lyrical sound with plenty of sweetness and detail made this one of the best tuners around upon its launch.



NAD 4040 1979 £79
Tremendously smooth and natural sound allied to low prices and good availability make this budget analogue esoterica.

MARANTZ ST-8 1978 £353
Marantz's finest radio moment. Warm, organic sound plus an oscilloscope for checking the signal strength and multipath.

YAMAHA CT7000 1977 £444
Combines sleek ergonomics, high sensitivity and an explicit, detailed sound.

SONY ST-5950 1977 £222
One of the first Dolby FM-equipped tuners, a format that came to nought. Still, it was Sony's most expensive tuner to date, and boasted good sound quality with brilliant ergonomics.



ROGERS T75 1977 £125
Superb mid-price British audiophile design, complete with understated black fascia. Smooth and sweet with fine dimensionality.

SANSUI TU-9900 1976 £300
A flagship Japanese tuner. It boasts superlative RF performance and an extremely smooth and lucid sound.



TECHNICS ST-8080 1976 £180
Superb FM stage makes for a clean and smooth listen.

REVOX B760 1975 £520
The Revox offers superlative measured performance although the sound isn't quite as staggering as the numbers. Fine nonetheless, and surely the most durable tuner here?

SEQUERRA MODEL 1 1973 £1300
Possibly the ultimate FM tuner. Massive in terms of technology, size and features dedicated to extracting every ounce of performance from radio, including impressive multi-purpose oscilloscope display.

LEAK TROUGHLINE 1956 £25
Series I an interesting ornament but limited to 88-100MHz only. II and III are arguably the best-sounding tuners ever. Adaptation for stereo easy via phono multiplex socket. Deliciously lucid with true dimensionality.

HEADPHONE AMPLIFIERS

GRAHAM SLEE NOVO 2009 £255
Dynamic headphone amplifier with a great sense of timing. Crisp, clear treble and warm midrange gives an involving sound.



MUSICAL FIDELITY X-CAN V8 2008 £350
Open and explicitly detailed sound plus serious bass wallop. A great partner for most mid-to-high end headphones.

CD PLAYER/RECORDERS

MUSICAL FIDELITY TRIVISTA 2002 £4000
When playing SACDs, the sweetest, most lucid and lyrical digital disc spinner we've heard. Old school stereo, pure DSD design. CD sound is up in the £1000 class, too! Future classic.

MARANTZ SA-1 2000 £5,000
The greatest argument for SACD. This sublime Ken Ishiwata design is utterly musically convincing with both CD and SACD, beating most audiophile CD spinners hands down.



SONY MDS-JE555ES 2000 £900
The best sounding MD deck ever, thanks to awesome build and heroic ATRAC-DSP Type R coding.

PIONEER PDR-555RW 1999 £480
For a moment, this was the CD recorder to have. Clean and detailed.

MARANTZ DR-17 1999 £1100
Probably the best sounding CD recorder made; built like a brick with a true audiophile sound and HDCD compatibility.



CAMBRIDGE AUDIO CD4SE 1998 £200
A touch soft in the treble and tonally light, but outstanding in every other respect.

SONY TCD-8 DATMAN 1996 £599
Super clean sound makes this an amazing portable, but fragile.

LINN KARIK III 1995 £1775
The final Karik was a gem. Superb transport gives a brilliantly tight, grippy dynamic sound, albeit tonally dry.

NAIM CDS 1990 £N/A
Classic Philips 16x4 chipset with serious attention to power supplies equals grin-inducing sonics.

MARANTZ CD73 1983 £700
A riot of gold brushed aluminium and LEDs, this distinctive machine squeezed every last ounce from its 14x4 DAC-super musical



MERIDIAN 207 1988 £995

Beautifully-built two-box with pre-amp stage. Very musical although not as refined as modern Bitstream gear. No digital output.

SONY CDP-R1/DAS-R1 1987 £3,000

Sony's first two boxers was right first time. Tonally lean, but probably the most detailed and architectural sounding machine of the eighties.

CAMBRIDGE AUDIO CD1 1986 £1500

Inspired Stan Curtis redesign of Philips CD104, complete with switchable digital filter. Lean but tight and musical performer.

MERIDIAN MCD 1984 £600

The first British 'audiophile' machine was a sweeter, more detailed Philips CD100. 14x4 never sounded so good, until the MCD Pro arrived a year later.

SONY CDP-701ES 1984 £890

Sony's first bespoke audiophile machine used a 16x2 DAC to provide a clinically incisive sound; supreme build quality allied to the pure unadulterated luxury of a paperback-sized remote control.

YAMAHA CD-X1 1983 £340

Nicely built 16x2 machine with a very sharp and detailed sound; sometimes too much so. Excellent ergonomics, unlike almost every other rival of the time.

SONY CDP-101 1982 £800

The first Japanese CD spinner was powerful and involving. Brilliant transport more than compensated for 16x2 DAC, and you even got remote control!



ANALOGUE RECORDERS

AIWA XD-009 1989 £600

AIWA's Nak beater didn't, but it wasn't half bad nonetheless. Massive spec even included a 16x4 DAC!

NAKAMICHI CR-7E 1987 £800

The very best sounding Nakamichi ever - but lacks the visual drama of a Dragon.



SONY WM-D6C 1985 £290

Single capstan transport on a par with a Swiss watch, single rec/replay head better than most Naks. Result: sublime.

PIONEER CTF-950 1978 £400

Not up to modern standards sonically, but a great symbol of the cassette deck art nonetheless.

YAMAHA TC-800GL 1977 £179

Early classic with ski-slope styling. Middling sonics by modern standards, but cool nonetheless!

SONY TC-377 1972 £N/A

A competitor to the Akai 4000D open reel machine, the Sony offered better sound quality and is still no slouch by modern standards

REVOX A77 1968 £145

The first domestic open reel that the pros used at home. Superbly made, but sonically off the pace these days.

COMPACT DISC TRANSPORTS

ESOTERIC PO 1997 £8,000

The best CD drive bar none. Brilliantly incisive, ridiculously over engineered.



TEAC VRDS-T1 1994 £600

Warm and expansive sound made this a mid price hit. Well built, with a slick mech.

KENWOOD 9010 1986 £600

The first discrete Jap transport was beautifully done and responds well to re-clocking.

DACS

DCS ELGAR 1997 £8500

Extremely open and natural performer, albeit extremely pricey - superb.

DPA LITTLE BIT 3 1996 £299

Rich, clean, rhythmic and punchy sound transforms budget CD players.

CAMBRIDGE AUDIO DAC MAGIC 1995 £99

Good value upgrade for budget CD players with extensive facilities and detailed sonics.

PINK TRIANGLE DACAPO 1993 £N/A

Exquisite; the warmest and most lyrical 16bit digital audio we have ever heard.

QED DIGIT 1991 £90

Budget bitstream performer with tweaks aplenty. Positron PSU upgrade makes it smooth, but now past it.

CABLES

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vinyl section

contents

FEBRUARY 2016

www.hi-fiworld.co.uk**CLEARAUDIO ABSOLUTE PHONOSTAGE 95**

An innovative phonostage from Clearaudio, reviewed by Noel Keywood.

HANA EH/EL MOVING COIL CARTRIDGES 103

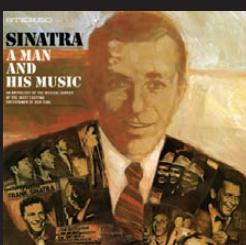
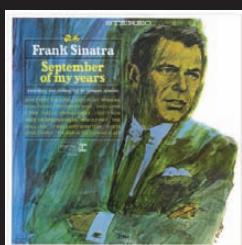
These new budget MC cartridges from Japan are a hi-fi bargain says, Paul Rigby.

TECHNICS SU-7100 PHONOSTAGE 108

A valve phono-amp in a classic 1970s Technics integrated amplifier cabinet? Noel Keywood is intrigued.



news

**FRANK AT 100**

It's the 100th anniversary of Frank Sinatra's birth, triggering three vinyl reissues from 1965 via Universal.

'September of my Years' is a brilliant 60s issue which sees Sinatra adapt, in terms of tone, to strike a rich and stately air.

'Sinatra '65' is under-rated. Full of rarities while his contemporary inclusions are not bad at all.

The most surprising release is the compilation 'A Man And His Music', a 2-LP collection spanning his entire career to that point. Don't dismiss it. It features re-recorded versions of the original, non-Reprise songs, plus three cuts especially for this project and, intriguingly, an album-spanning narration from the man himself.

MOV

New releases this month from Music On Vinyl (www.musiconvinyl.com) include Los Lobos' 'Gates of Gold' – the band's new album that touches on past styles but experiments with new flavours. Surprisingly good.

'Bitter Tears' is not surprisingly good, it is a surprisingly daring look at Native American Indians from Johnny Cash: a sensitive LP.

From Madrugada is alt.rock with the 'The Deep End' (2005). It's like a harder, darker REM release. Accessible.

From Stevie Ray Vaughan is 'The Sky is Crying' (1991), a posthumous, out-take collection that is consistent, nevertheless.

Also look out for Betty Wright's 'My First Time Around' (1968) and Nicole Atkins' 'Neptune City' (2007).

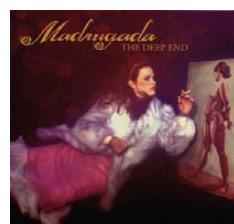
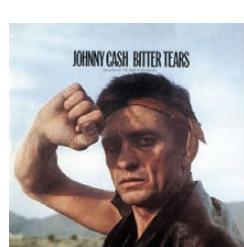
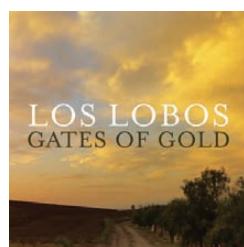
MOBILE FIDELITY

Released in 1967, Bob Dylan's 'Greatest Hits' features songs from Dylan's first seven albums. A great sampler. Also look out for 'Planet Waves' (1974). Not often reissued, it offers rustic homespun songs. It's airy and diffuse.

From Miles Davis, his 'Tribute To Jack Johnson' (1971) is a pure electronic jazz record featuring some nasty rock/jazz but filled with freedom and wonderful solos.

From Jefferson Airplane, their second LP 'Surrealistic Pillow' (1967) combines folk rock and psychedelia. Melodic and complex, it was this group's very best.

Finally, The Allman Brothers Band 'At Fillmore East' (1971) revealed the group's amazing instrumental interplay. Has a real jazz/blues aspect to the inherent rock.





VINYL COLLECTOR

Three more vinyl releases from this intriguing imprint (www.facebook.com/vinylcollector).

Released in 2002, Beth Orton's 'Daybreaker' might lack engagement but it was her most mature LP to date, although quite gloomy. 'Comfort Of Strangers' (2006) was, contrastingly, artless and fresh by comparison.

Also, John Peel faves Babes In Toyland released 'Fontanelle' (2007) as a focused and powerful LP with a harsh, abrasive and punkish fury.

ELVIS COSTELLO

Although traditionally linked with the classic punk era, Costello has drawn from pop, reggae, country, Tin Pan Alley and more when creating his oeuvre. The Back To Black imprint ([www.backtoblackvinyl](http://www.backtoblackvinyl.com)) has released a range of back catalogue issues from Costello, including the debut 'My Aim Is True' (1977; as much pub rock as punk); 'This Year's Model' (1978; solid, reckless punk); 'Armed Forces' (1979; more production, broader compositions); 'Get Happy' (1980; strong soul outing); 'Imperial Bedroom' (1982; traditional pop with Beatles-esque flavours); 'Punch the Clock' (1983; slick pop but inconsistent songs output); 'Goodbye Cruel World' (1984; the LP suffered from his troubled personal life as much as he did); 'Blood & Chocolate' (1986; a return to rock and a return to form) and 'Taking Liberties' (1980; aimed at the USA and featuring tracks that had not been issued in that country).



...AND FINALLY

From Static Caravan (www.staticcaravan.org) is Victories At Sea's 'Everything Forever'. It reminds me of the carefree indie scene from the early eighties (that's a complement).

From 1960, John Lee Hooker's 'Sings Blues' (Sundazed; www.sundazed.com) features 'Slim's Stomp', 'Shake 'Em Up' and 'Late Last Night'.

A compilation, 'Dishoom's Bombay London Grooves, 'Slip-Disc' keys into 60s British-Indian vibes from the likes of Ananda Shankar, The Bombay Royale and The Savages.

From Ivar Grydeland is 'Stop Freeze Wait Eat' (Hubro), an LP of hesitant soundscapes and sound punctuation utilising cool avant-garde themes.

Via Max Richter, the soundtrack to Season One of 'The Leftovers' (Silva Screen; www.silvascreen.com) the HBO TV series takes a series of classical structures to convey drama and pastoral flavours, but always with a slightly left field aspect.

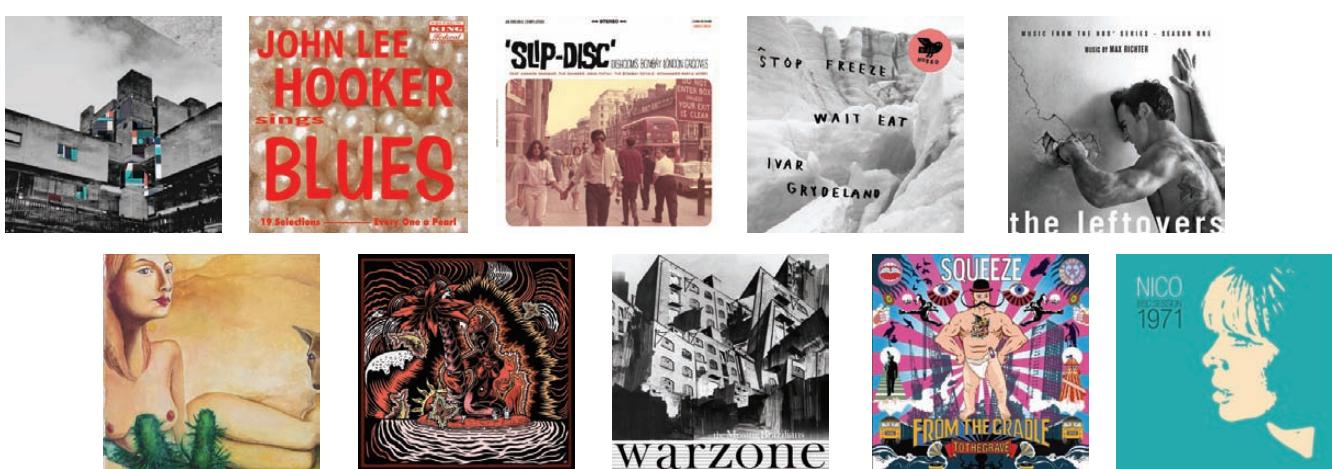
From Wolf Eyes 'I'm A Problem: Mind In Pieces' (Third Man) is dismissive rock, moody, atmospheric, insistent, gothic and slightly industrial.

Undergrunnen's self-titled album (Jansen; www.jansenplateproduksjon.no) is lively, poppy, sparkly with a sixties-etched rock jerky paranoia. From the same label, Bror Forsgen also taps into the sixties, this time a dreamy, lounge vibe combined with a more modern, strings-laden pop approach.

From The Missing Brazilians comes 'Warzone', originally released in 1984 via Adrian Sherwood, mixing electronica and dub. Features Shara Nelson and Annie Anxiety. Includes a poster.

A new album by Squeeze? Absolutely, 'Cradle to Grave' (Virgin), the first batch of new Difford/Tilbrook songs since 1998. Although you may have heard some of these songs already on the Danny Baker-inspired TV comedy of the same name.

From Gearbox (www.gearboxrecords.com) is Nico's '1971: BBC Session'. The songs include 'No One Is There' and 'Frozen Warnings' (from 'The Marble Index'), 'Janitor of Lunacy' (from 'Desertshore') and 'Secret Side', which would be recorded three years later for 'The End', her Island album.



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Move Ahead



Clearaudio fit a head amplifier into an arm. Noel Keywood looks at an interesting move.

Putting a micro-miniature amplifier into an arm makes a lot of sense; it should offer better sound quality from vinyl, so Clearaudio's Absolute Phono that does just this intrigued me. Would others follow; could this idea be used in less esoteric, more affordable designs? In which case Absolute Phono would lead the way, showing us what to expect in future.

Absolute Phono in its basic 'outside' incarnation comprises a miniature head amplifier that is fitted within their Universal tonearm, used in conjunction with an external

phono amplifier and separate power supply, the three working together and being inseparable. For those that don't want an arm so fitted, with its incompatible lead out cable, there is an 'inside' version where the head amp is combined with the main phono amp.

For review we were supplied with a Clearaudio Innovation belt-drive turntable, a Clearaudio Universal tonearm with head amplifier installed, and the two external boxes of the Absolute Phono stage. This is quite a set-up and it's expensive – but it bristles with innovation.

This review was about Absolute Phono, but because Clearaudio do not make clear that Absolute Phono suits only high impedance MC cartridges – notably their own – I ended up reviewing much more. This included a compatible Clearaudio da Vinci V2 MC cartridge.

And the price? Are you sitting comfortably? The Absolute Phono (outside) costs £8995, da Vinci V2 MC cartridge is £3850, the Innovation turntable lacquered wood as shown is £6400 and the Universal arm relatively cheap at £3350. The cost of fitting the head amp into the Universal arm is included in the



Absolute Phono 'outside' and below its power supply. Inputs lie at centre: d.c. power and a multi-pin socket for arm connection.

Outputs are gold plated unbalanced phono sockets, and balanced XLR sockets.

price of Absolute Phono you will be delighted to know.

It would have been quite easy for Clearaudio to have used a simple little conventional amplifier in the arm, but they decided not to. Instead the arm mounted amplifier is a special sort of amplifier known as a 'transconductance amplifier' that acts much like an input transformer, minimising hiss. The Absolute Phono is very quiet as a result – that's the good bit.

And the bad bit? It doesn't suit all moving coil cartridges. It is tailored for Clearaudio moving coils, we found from measurement, a fact that Clearaudio subsequently confirmed when asked. This limitation was not made clear in their product data nor on their website and is the reason we delayed the review one month whilst the problem was identified and dealt with. Because the issues are very technical I cover them in a separate box-out, however. Specifically, low impedance moving coils of 30 Ohms or less are unsuitable, meaning Ortofons and Lyras we were told, unless a series resistor is wired in – hardly practicable.

Gain increases as coil impedance decreases, a feature of transconductance amps., but overload headroom also decreases and distortion increases – hence the unhappy sound with our Ortofon A95 cartridge, and its 5 Ohm generator.

ABSOLUTE PHONO

Arm modification for the head amp of Absolute Phono 'outside' means a special signal cable and connector with power lines is installed, making the arm unusable with anything other than Absolute Phono, a restrictive situation. The 'inside' contains the transconductance head-amp in the external case, so it is less restrictive, and it behaves like the

'outside' reviewed here so our observations apply to it.

The tiny in-arm head-amp contains two miniature surface-mount silicon chips plus a host of components. Various commercial transconductance/transimpedance amps. are available in surface-mount form for this purpose, having packages that measure just 3mm square – little larger than a match head. You can see this package – that co-incidentally I am designing into a low noise FET cartridge test-bench amplifier – in our photograph. I've

cartridge can be connected; there are no additional power lines to complicate the user interface. It also keeps arm effective mass down a little.

The arm's signal lead is terminated in a small multi-pin 'VGA' style plug, not in phono plugs. This mates with a matching socket on the external phono stage, taking the amplified signal in for further amplification, RIAA equalisation and then line drive output stages that feed unbalanced phono and balanced XLR sockets.



The ceramic main bearing and optical speed sensor, lying in front of it, are shown here. Also the phono arm lead with its VGA style multi-pin connector that carries both signal and power to the head amp.

had it suggested to me that amplifiers like this could even be put into pickup cartridges, so you can see the potential here.

Putting a miniature amp like this into the arm and not the headshell, or even the cartridge, means the usual four signal wires (white, blue, green, red) are available for cartridge connection and, potentially, any

Why go to all this bother? Basically, to keep low level signal lines between cartridge and amplifier as short as possible, so making them resistant to hum and noise. The idea of the head-amp is to step up the tiny signal from the cartridge as closely as possible to the cartridge itself. This is good audio engineering practice and it also allows balanced

lines to be used, to suppress both hum and what is termed common-mode interference. This is interference that affects both signal lines equally and will cancel itself out in a balanced system with high CMRR, or Common Mode Rejection Ratio. So the use of an arm-installed head amp seeks to avoid many problems at source and should lead to improved sound quality.

I tried to open the Absolute Phono main amplifier case to check gain settings and found I could not –

have done just as well, without the matching problems. Audiolab's 8300A amplifier, reviewed in this issue, manages similar input noise, and uses conventional voltage amplifiers they told me.

INNOVATION TURNTABLE

The belt drive Innovation turntable is another tour-de-force of engineering. Most impressively, its steel sub-platter has a precision circular optical grating, read by an LED

lower platform, although I generally hand cue. This arm is also easy to set up. Although ours had a head-amp fitted there was no sign of it, except insofar as the output leads were terminated in a VGA-style multi-pin plug.

DA VINCI V2 CARTRIDGE

This little unit, price £3850 no less, is quite an esoteric design. Although light at 7gms it contains eight magnets, Clearaudio say, and gold field coils. The stylus cantilever is a boron rod, ceramic coated to suppress resonance. The stylus shape is simply described as Micro HD, and it traced inner grooves accurately our measurements showed.

The da Vinci isn't entirely conventional in specification though, since its 50 Ohm generator needs a 300 Ohm load, Clearaudio say, where most phono stages offer a 100 Ohm input load.

Also, tracking force is high at 2.8gms and even with this the da Vinci V2 is not the world's best tracker – see Measured Performance. It has a lot of coil turns to get high output and so minimise phono stage hiss. The penalty paid is higher effective tip mass, which compromises mid-band tracking where accelerations are high and tip mass crucial. It also increases coil resistance, hence why Clearaudio recommend a 300 Ohm input.

Measurement confirmed this trade off, explaining why a relatively high tracking downforce of 2.8gms is recommended for the da Vinci V2. Output dropped into a 100 Ohm load but frequency response did



Clearaudio's da Vinci V2 moving coil cartridge, mounted in the Universal arm. The light anodised aluminium body of this cartridge is finished in a striking red. Its cantilever is a ceramic coated boron rod and the signal coils wound from gold.

and there aren't any! Absolute Phono is for moving coil cartridges only and has no gain settings. Gain increases with decreasing load impedance and with a 10 Ohm test generator as source was massive. This is why we contacted Clearaudio in consternation!

Absolute Phono is for MC cartridges having an impedance of 30-70 Ohms Clearaudio say – a relatively high value. Most MC cartridges have lower impedance – 10 Ohms or less, see our box-out – invoking excessive gain and overload distortion from Absolute Phono as a result. When I tried our Ortofon A95 MC with a second-sample Absolute Phono (the first was unstable under test) it did not sound happy – brittle and dry.

With a 50 Ohm source all was well however. But this meant I could not review Absolute Phono with a normal moving coil cartridge, only a Clearaudio design, so importers Sound Foundation then sent us a da Vinci V2 – see Measured Performance of this cartridge.

Did Clearaudio's transconductance head amplifier meet or better the performance of an input transformer, bearing in mind these set a standard difficult to beat? No, it did not – but it got close. However, a conventional voltage amplifier would

light source and optical receiver. This gives a speed readout, enabling speed correction using feedback – servo-control in other words. Few turntables do this from the platter; I can think only of Technics Direct-Drive turntables, such as the famous SL-1210.

But that isn't enough for Clearaudio! No sir – they also give the Innovation a 'magnetic bearing', a conventional shaft-bearing that uses magnetic repulsion to support the platter's weight. And peculiar it was too, tending the throw the central hub off if it wasn't restrained. Onto that hub fits a heavy steel sub-platter and then on top of that fits a massive clear acrylic top platter, all fitting one to the other with fine precision. The whole was superbly engineered and finely finished. Power comes from a cheap plastic wall wart though, but at least it's invisible. Atop one of the support pillars lie buttons that select 33, 45 or 78 rpm, and Off. There is an optional dust cover.

UNIVERSAL ARM

This is a wrapped carbon fibre arm available in 9in and 12in versions and we had the shorter of the two. With its stepped resonance-damped structure, low mass and ball bearings in both planes of movement I found it easy to use. There is a damped lift-



Nowadays, silicon chips are commonly offered in miniature SOIC form (Small Outline Integrated Circuit). At 3mm square many can fit an arm, even a cartridge!

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not alter (it's a resistive generator) so this cartridge can be used with conventional 100 Ohm MC phono stages, in spite of Clearaudio's recommendations.

SOUND QUALITY

The cartridge was run in for 24 hours before use, playing in a locked groove (you can find one of these on Clearaudio's W&F test LP but I used DIN 45-542). The turntable had already been run for some time and was settled, measurement showed. The balanced outputs of the phono stage were connected to an Audiolab 8300A amplifier that has a balanced power amplifier topology, thence out to a pair of rather lovely Quadral Chromium Style 8 with ribbon tweeters we are currently using, prior to review.

The da Vinci is quite characterful: it did not take long to be sure that the basic tonal balance of this cartridge is slightly 'warm', Mark Knopfler's ditty 'True Love Will Never Fade' moving from silky smooth to positively full bodied from Kill To Get Crimson, on 180gm vinyl. Bass was big and strong; this is no bass light wimp!

Spinning Comfortably

Numb from the Scissor Sisters eponymously named album brought out the strength of the bass from Clearaudio's cartridge/preamplifier combo. Piano was full and rich in balance, making it sound gloriously large and imposing. At the other end of the spectrum treble was fast, clean and quite solid; although the da Vinci V2 has a warm balance it does not lack top end pizazz. This cartridge doesn't have the smooth coherence of our Ortofon Cadenza Bronze or A95, but instead a more obvious character, including a fast, incisive quality to accompany its low end strength.

Attempting to play The Scissor Sister's 45rpm double LP, Ta Da, after their first album delivered a surprise: neither LP would fit over the centre spindle, something that has never happened before with previous turntables for review, so it would appear the spindle is fractionally over-sized, but not by much since all other albums fitted.

Putting on my delightful torture LP, Carol Kenyon's 12in 45rpm disco single Dance With Me (from Lords of the New Church) spotlighted this turntable's strengths. The synthesised drum beat was rock steady in timing, having a hard insistence to

Moving coil (MC) cartridges employ miniature coils of fine wire, moving in a magnetic field, to produce a music signal. These miniature coils typically have a resistance of 5-10 Ohms; Audio Technicas are around 10 Ohms and both Lyras and Ortofons come in around 5 Ohms, for example.

A rule of thumb is to use a load ten times larger to avoid unnecessary losses, meaning 100 Ohms. This is the value generally used as an input load in MC phono pre-amplifiers, it has become the de-facto standard. When you buy an MC preamp you will commonly see this value specified as the input load, described as a "resistance" or "impedance".

Adding turns to the signal coil of an MC cartridge increases its output, but also increases its coil resistance, and this is what Clearaudio have chosen to do with their MC cartridges that they specify as having 50 Ohm coils. The potential benefit is reduced hiss, the drawback a bigger and heavier coil that degrades tracking ability, as we found in tests, since the stylus has to move this coil.

Using the same x10 rule of thumb, such a cartridge needs a 500 Ohm input load, making Clearaudio's MC cartridges seemingly incompatible with conventional MC phono preamps; you must use a Clearaudio preamp (300 Ohm) with them to gain the benefit of their higher output.

Most MC cartridge manufacturers choose to use fewer coil turns and sacrifice output to improve tracking, especially in the midband to cope with loud vocals. With Abbey Road Studios recently telling us vinyl's comeback is stimulating the production of very hot cuts onto half-speed mastered 45rpm singles and LPs, the tracking ability of cartridges is becoming ever more important, making Clearaudio's choice of output over tracking look questionable in today's vigorous vinyl market.

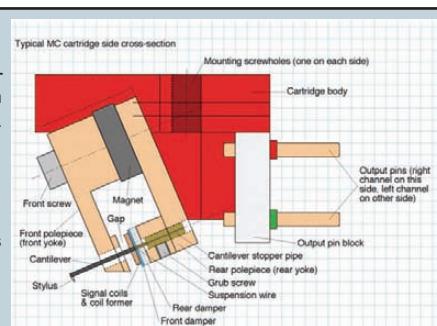


Diagram courtesy Henley Designs.

Internal view of a moving coil cartridge. The tiny signal coils are attached to the cantilever (bottom left).

it as a result; there was none of the watery quality usually suffered by belt drives (and avoided by idler and direct drives). Individual instrumental strands had tremendous presence, underpinned by big dynamic impact and there was superb sense of depth – oh how good can LP get against the flatness of digital!

When Carol Kenyon's vocal started she burst onto the sound stage with enough body to approach Adele, shouting "dance with me" from centre stage – I was impressed! This is a gutsy performance and the Clearaudio combo delivered it like Tyson Fury. Whoa!

This performance complemented classical equally; violins of the Trondheim Soloists had a lovely fulsome quality, behind Marianne Thorsen playing Mozart violin concertos, recorded in DXD and pressed onto 180gm vinyl. This is a lovely album and the Clearaudio system reproduced all its loveliness, from the superb playing of the orchestra to the backward-layered sound stage, instruments standing out in delightful clarity, all the while the whole performance coming across as assured and stable, in its timing and its firmly rendered transient edges.

The only small reservation I had at times with this cartridge/amplifier combo was that the midband could be a little recessed and this affected Kate Bush, singing King Of The Mountain, from Aerial (200gm vinyl). She was somewhere way back on the sound stage and I struggled a bit to make out her contribution against

the heavy reggae bass line.

Hiss was inaudible, with volume set to 'very loud' and my ear against the loudspeakers. The combination of high output MC cartridge with Clearaudio's in-arm, low noise head amplifier and phono stage banished hiss and hum completely at normal listening levels. With volume at maximum there was slight hiss but no hum, a benefit of balanced working. Technically, the head amp provided the sort of results that might be expected at the price.

CONCLUSION

This is a charismatic product, shall I say. Whilst the Innovation turntable and Universal arm follow a conventional pattern, Clearaudio's cartridges do not. As a result the Absolute phono stage, complete with its arm mounted head amplifier, wasn't quite what I was expecting, because it matches Clearaudio cartridges but few others.

Putting an amp in an arm is an interesting way of doing things – and since modern silicon chips are just 3mm square expect to see more manufacturers burying them in headshells, even cartridges, in the way Clearaudio have done here.

Pity that the Absolute Phono suits Clearaudio's 50 Ohm cartridges and few others.

Irrespective, the final sound of this turntable combo was impressive in its own way: big, forceful, a tad warm but exciting at the same time. Definitely one for aficionados with a Ferrari in the drive way.

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The internal head amplifier is priced a smart of the Absolute Phono - if not supplied at the same time as the tonearm the arm is returned to Clearaudio for this to be fitted.

Absolute Phono (outside version)

£8995 includes the cost of fitting the head amp into the arm.

Dustcover availableA large acrylic 'box' that fits over the entire structure.
£450.00**MEASURED PERFORMANCE****ABSOLUTE PHONO**

Equalisation was a little inaccurate, our frequency response analysis shows (measured from a 50 Ohms source). Relative to 1kHz treble rises by +0.5dB and bass by around +1dB, so both 75 μ s and 318 μ s time constants could usefully be trimmed. This affected the response of Clearaudio's da Vinci V2 cartridge.

There is some subsonic bass roll off below 10Hz, to give a small amount of warp filtering and it may well be this filter lifts upper bass a little.

Gain was fairly standard for MC at x1100 (60dB) with a 50 Ohm MC cartridge, rising to x2100 (66dB) with a 10 Ohm cartridge; Clearaudio recommend 30-70 Ohm MC cartridges only. With a 50 Ohm cartridge overload occurred at 8.2mV in / 7.4V out, normal enough figures and adequate in real life use; with a 10 Ohm cartridge overload decreases to a low 1.7mV in.

Distortion reached a 0.1% threshold figure at a high 7mV in, from a 50 Ohm source, so no problems here.

Noise (equivalent input noise, A wtd.) measured a low 0.1 μ V. However, it is possible to get lower with conventional transistor stages and input transformers measure 0.08 μ V, a small but useful 2dB quieter. So Absolute Phono is very good, but not ground breaking in this respect.

DA VINCI V2 MC CARTRIDGE

We measured da Vinci V2 through Absolute Phono, and then through a measuring preamplifier with input load options. Through our measuring preamp, using a high load, da Vinci measured almost flat our response analysis here shows, with slight upper midband droop (2dB variance). This is a good result.

Through Absolute Phono response suffered more treble loss (5dB variance). This will give an obviously warm sound.

Clearaudio provide a calibration certificate with da Vinci that was peculiarly inaccurate, showing treble

peaking that did not exist, and channel imbalance – odd.

Tracking at low frequencies was good, using the high 2.8gms VTF specified, but in the midband mediocre, the stylus mistracking 20cms/sec and jumping out of the groove at 25cms/sec, likely due to tip mass caused by 50 Ohm signal coils. Most MCs just manage to clear 25cms/sec. – and at lower tracking force.

Output was high at 0.6mV at 3.54cms/sec rms, as expected from 50 Ohm signal coils. Vertical tracking angle was very high at 35 degrees, and vertical distortion high at 7% as a result. Channel separation was low at 19dB.

The da Vinci is a high-ish output MC with a high impedance generator that is specified as needing a non-standard 300 Ohm load, but our measurements showed it worked into a 100 Ohm input.

Even with the high 2.8gms tracking force, midband tracking was poor. Rivals all manage better, our measurements show.

INNOVATION TURNTABLE

The turntable ran a little slow (-0.7%) as delivered but speed was adjusted upward to correct this. Variation of speed was minimal, resulting in very low Wow & Flutter figures. Basic wow was 0.08% and total W&F weighted was 0.06%, as low as it is possible to measure with our DIN 45 452 test disc, when carefully centred. Our speed variation analysis clearly shows very low level of basic rate variation at 33rpm, and absence of higher order components. The Innovation has excellent measured performance and will sound speed stable in use.

ABSOLUTE PHONO

Frequency response 8Hz-20kHz

50 Ohm source

Gain x1100 (60dB)

Overload 8mV in / 7V out

Noise (e.i.n. A wtd) 0.1 μ V**10 Ohm source**

Gain x2100 (66dB)

Overload 1.7mV in / 3.6V out

Noise (e.i.n. A wtd) 0.1 μ V**DA VINCI V2 MC CARTRIDGE**

Tracking force 2.8gms

Weight 7gms

Vertical tracking angle 35 degrees

Frequency response 20Hz - 20kHz

Channel separation 19dB

Tracking ability (300Hz)lateral 85 μ mvertical 45 μ m

lateral (1kHz) 18cms/sec.

Distortion (45 μ m)

lateral 1%

vertical 7%

Output (5cms/sec rms) 0.9mV

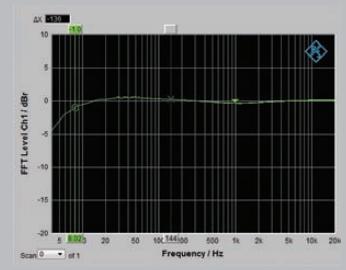
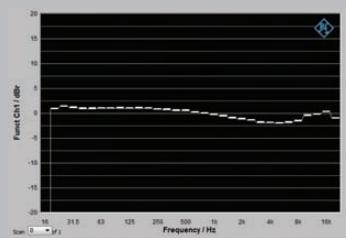
INNOVATION TURNTABLE

Speed accuracy -0.7%

Wow 0.08%

Flutter 0.05%

Total W&F weighted 0.06%

FREQUENCY RESPONSE*(Absolute Phono)***FREQUENCY RESPONSE***(da Vinci V2)***ABSOLUTE PHONO****£8995****(INC. COST OF FITTING HEAD AMP INTO ARM)****INNOVATION TURNTABLE**
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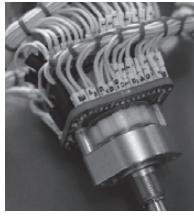
- suits Clearaudio cartridges
- arm incompatibility
- two box
- MC only
- not adjustable

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Art Dudley - Stereophile, October 2015



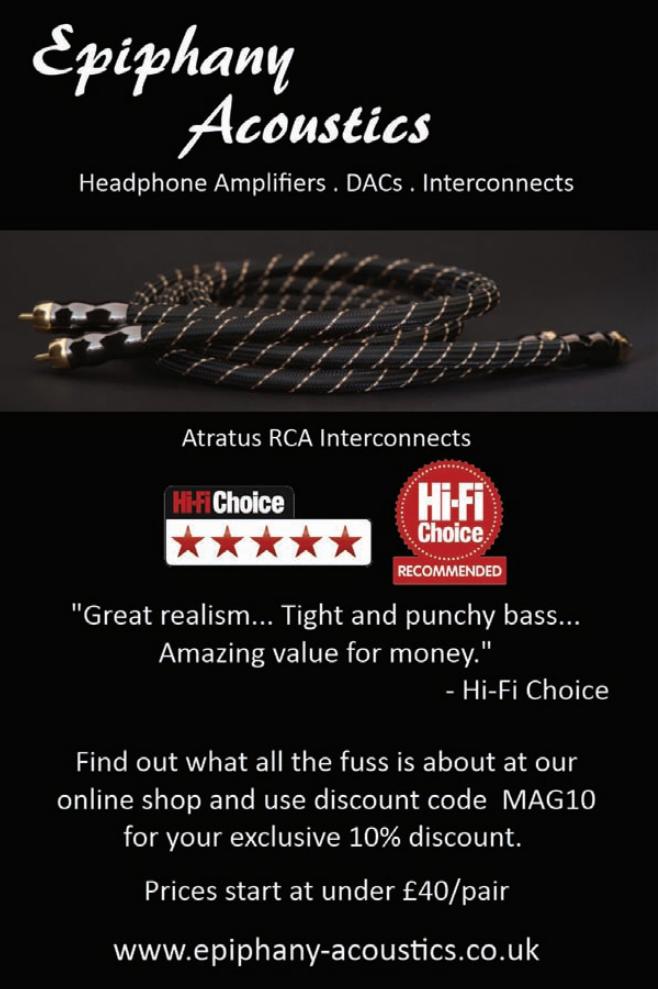
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Hana And Her Sister...

Meet the Hana twins...a pair of moving coil cartridges from Japan that can be yours at an exceptionally low price. Paul Rigby is smitten by their charms.

Low cost moving coil (MC) cartridges are a rare beast – for very good reasons. Besides my budget reference Denon DL-103, I find it tough to recommend a low cost MC, since most are not so good, so there was a certain amount of initial trepidation before reviewing these two designs from the Japanese outfit Hana: the EH and EL.

Manufactured by the Excel Sound Corporation (a manufacturer of cartridges for forty years), the EH (Elliptical High) is a high output (2mV) model connected through an MM phono amplifier, while the EL (Elliptical Low) is a low output (0.5mV) cartridge connected through an MC phono amplifier.

Both arrive in a 'moss green' coloured body and both sport an aluminium cantilever and 'synthetic elliptical' stylus; there are more expensive Shibata stylus versions.

Although these cartridges feel solid, they are light. Shockingly light, in fact, when compared to my budget reference Denon DL-103 which weighs in at 8.5g – against the Hanas' 5g. Fortunately, my Origin Live Enterprise arm was able to cope, but you might like to make doubly sure that your turntable's arm can balance out such a light cartridge if interested. The recommended tracking force of both models is 2gms.

SOUND QUALITY

I was going to start with Jazz, but switched to a variant instead. Edie Gorme and a slice of bossa nova on the album 'Cuatro Vidas' with the



backing outfit El Trio Los Panchos and the soft ballad 'Vereda Tropical'.

This track is perfect when challenging low-priced MC cartridges. It offers delicate yet complex vocal harmonies, bold Spanish guitars and a recessed version of the same, some relatively exotic percussion via conga drums, wood block and maracas and plenty of potential silence flowing around the lot.

I selected this LP to focus more on the mids and treble areas of the sound spectrum, although a subdued double bass did ask questions of the Hana's lower frequency capabilities.

To begin, I selected the EH model, which meant plugging the turntable into the MM sockets of my Icon Audio PS3 phono pre-amp and upping the gain a couple notches to reach normal MM volume.

My first impressions of this Hana

reflected our tests. The EH was a very smooth, easy-going performer. Gorme had an attractively husky edge to her delivery that was beautifully portrayed here, along with subtleties such as intakes of breath and upper midrange vocal straining during crescendos. The singers providing a harmonic backing were not just smoothly portrayed, but mellifluous in tone.

Moving to the Spanish guitars, both lead and rhythm versions were accurately reported. In fact, the latter, normally a rather shy instrument, was illuminated and its player found to be amusing himself in the corner of the soundstage, I perceived, while the entire bank of percussion, shoved onto one channel by the mastering engineer, had admirable instrumental separation. Hearing each instrument as it entered and left the

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arrangement was never a problem.

Turning to more dynamic fare, I chose a newly re-issued Joy Division album – Substance – and played the aggressive song 'Leaders of Men', introduced by a rather insistent bass guitar.

Lead vocals were articulated well by the EH. There was a lot of passion and energy infused into this area which could have invited occasional slurring and blurring from inaccurate stylus tracing, but the EH successfully resisted any such urge.

More than that, the texture of the vocal delivery added to the emotive presentation and this helped my ear engage with the power of the music.

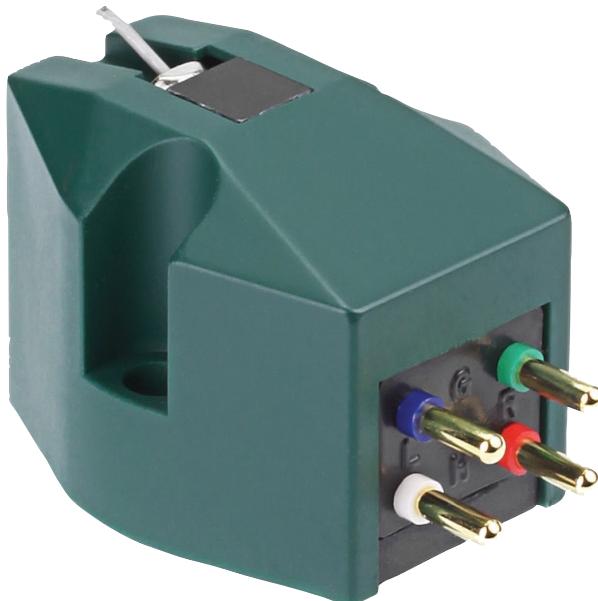
Bass, although lacking a touch of punch and attack, still delivered sufficient heft and power to provide a balance to the track as a whole.

This aspect also gave the track a forceful foundation. Similarly, the bass

and a rich sweeping effect during the mid-track string crescendos, while the wind section, free of any suggestion of brittleness, offered calm assurance. As the track reached its conclusion, an admirable focus was evident, as the arrangement became more complex in structure.

There was a recorder 'solo' in the track 'Tema dei Ricordi' that showed how relatively revealing the EH can be for an MC at this price. This is good for critical audiophiles, there was enough information to fully examine and judge the master.

On the other hand, if the master or pressing was not up to the job then the music became less enjoyable. That was the case here: the master failed to cope with dynamic extremes causing the recorder solo to lapse into brightness. Of course, this is not a



Despite its solid chassis, the Hana is a lightweight 5gms.

still producing an impressive degree of detail, had a touch of warmth.

This could be heard via the plucked strings of the Spanish guitar which sat back in the sound stage a tad and, although they could still be easily heard, did not present quite the same sort of impact as the EH in terms of focus and clarity – a slight midrange glow being the result of that extra warmth. This element didn't effect the percussive effects tremendously but it did add extra romance and a slight softness to the vocals.

In some respects, this touch of warmth provided a new level of engagement when the ear focused on the vocal delivery. The slight warming tone beckoned to my ear and I heard the instrumentation almost float over the soundstage.

Moving to Joy Division I was impressed, faced with this high energy music, at how integrated the presentation appeared. Yes, the treble-infused cymbal strikes were not quite as focused or as reverb-laden as the EH, and the lead vocal was not as separated from the backing instruments either, but the EL did combine all the best parts of this intense, dynamic track and offered a highly enjoyable experience, nevertheless.

I quickly learned that the EL is all about that: the overall experience. Whereas the EH offers plenty of highlights and features to underline and admire, the EH excels in terms of how it co-ordinates music to offer a smooth, coherent and enjoyable event.

"The texture of the vocal delivery added to the emotive presentation while bass delivered sufficient heft and power to provide a balance to the track as a whole"

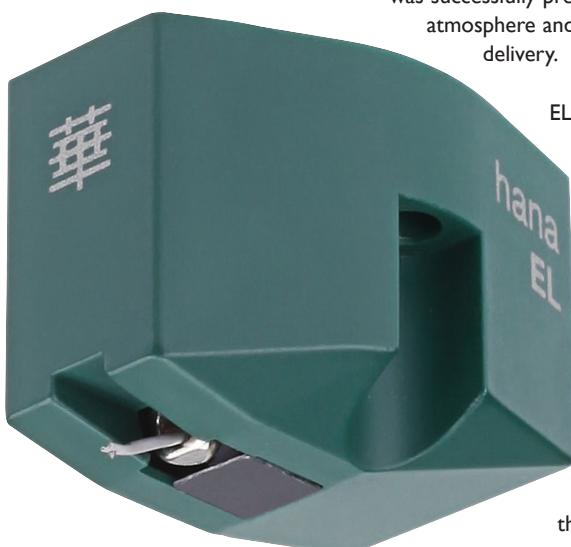
guitar, rolled along with an addictive toe-tapping rhythm.

Finally, looking for a more classically-arranged piece, I turned to Ennio Morricone and the music from the cult film 'Il Prefetto Di Ferro'. Its title track exhibited flow

criticism of the EH, which was merely doing its job.

Later, during the track 'La Ballata del Prefetto Mori', the challenging tones of Rosa Balestrieri, a folk singer who threatens to shred her vocal chords, was illuminated well by the EH. The texture of her voice was successfully presented, adding atmosphere and nuance to her delivery.

Moving to the EL, I began the sound test for this particular cartridge with Gorme's Spanish venture. As our tests showed, treble on this track was not quite as obvious and the midrange, while



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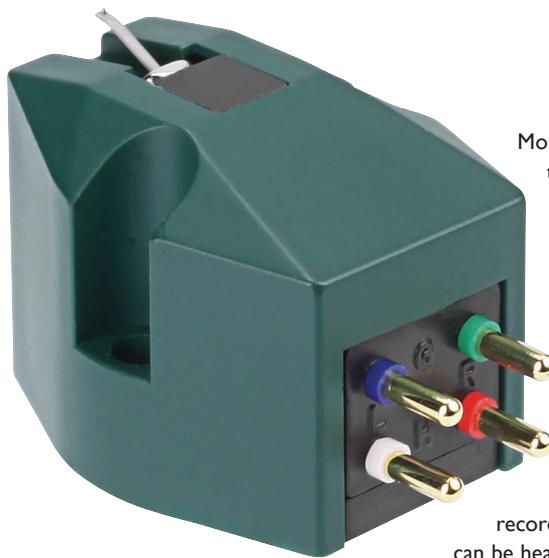
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One of the lower cost and better value for money MC designs currently on the market.

Bass performance, possibly because it's so tightly integrated within the soundstage of the EL, proved to be a powerful driving force. It never dominated or bloomed but remained balanced within the mix, providing a secure substructure and a sense of movement to the entire song. With the EL I found the temptation, with high energy music, was to let rip and push volume to maximum limits.

Moving to Ennio Morricone and the title track to 'Il Prefetto Di Ferro' the EL accentuated the rich sweeping strings and added a romantic flow to the wind section. As for the troublesome recorder solo that can be heard within 'Tema dei Ricordi'? Well, here the EL exhibited a rather more forgiving performance which actually meant a slightly more enjoyable listening experience on this track – especially when it came to that recorder which, via the EH, can be rather piercing to the ear. The EL toned down these strident effects slightly.

That's not to say that detail was found wanting, as during Rosa Balestrieri's performance her textured vocal output retained its full force, making her emotive impact fully present.

CONCLUSION

There's a sense of swings and roundabouts in terms of the EH and EL versions of the Hana cartridges.

I felt that the EH provided a slightly more accurate and tonally tad more exciting performance in how the detail was extracted from the master. The EL, with its small measure of extra warmth, gave the music a more forgiving nature.

In effect, you could say that the EL looks at the bigger picture. Rather than focusing upon specifics, it offers a possibly more engaging and flowing performance.

Both these moving coil cartridges performed well and they bring genuine advantages to any listening session at a low, low price. Terrific value for money then.

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Origin Live Enterprise 12" arm
Denon DL-103 cartridge
Icon Audio PS3 phonestage
Aesthetix Calypso pre-amp
Icon Audio MB 845 Mk.II monoblocks
Quad ESL-57 speakers with One Thing mods
Vertex AQ & Atlas cabling

HANA EL £276



OUTSTANDING - amongst the best

VALUE - keenly priced

VERDICT

A wholly tolerant cartridge that is smooth and engaging.

FOR

- musical engagement
- romantic mids
- bass
- value for money

AGAINST

- nothing at the price

HANA EH £276



OUTSTANDING - amongst the best

VALUE - keenly priced

VERDICT

Precise and investigative, the EH is ideal for those looking for detail.

FOR

- detail
- focus
- clarity
- value for money

AGAINST

- midband tracking

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MEASURED PERFORMANCE

Both EL and EH had remarkably smooth frequency response characteristics, with no treble peaking; both will sound a little warm or 'easy' but the low output EL is the warmer of the two – see our response analyses. The high output EH (Elliptical High) had stronger treble and was the most accurate.

The EH gave a very high 3.4mV output and needs a 47k Ohm MM load Hana state, so this is an MC compatible with an MM input.

Output from the EL was healthy at 0.7mV at 5cms/sec rms (1k load) where budget MCs can measure 0.3mV or so. However, the relatively high impedance 30 Ohm signal coil needs a 1kOhm load or greater Hana say, far above the 100 Ohms of most MC inputs. With 100 Ohms, output was a still-healthy 0.34mV and frequency response did not change.

Both cartridges tracked well but the low output EL, with its smaller signal coils, tracked best in the mid-band, managing a high 20cms/sec rms. The EH was a tad worse, managing 16cms/sec rms.

Channel separation measured around 28dB on both units and this is a good result.

Both had near-optimum vertical tracking angle, measuring 25 degrees (22 degrees is optimum), minimising distortion on vertical modulation (L&R images).

Both cartridges are very light at 5gms where 6gms is a common minimum. As a result some arms may not balance out unless extra weight is added at the headshell.

Otherwise, both Hanas measured well all round – and the EL can be used with conventional 100 Ohm MC phono stages in spite of what Hana say. NK

Hana EL/EH

Tracking force	2gms
Weight	5gms
Vertical tracking angle	26degrees
Frequency response	20Hz - 18kHz
Channel separation	29dB
Tracking ability (300Hz)	
lateral	80µm

vertical 45µm

lateral (1kHz) 16/20 cms/sec.

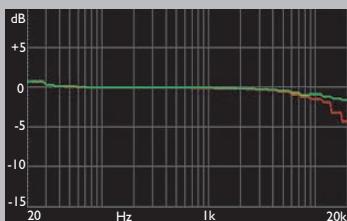
Distortion (45µm)

lateral 0.7%

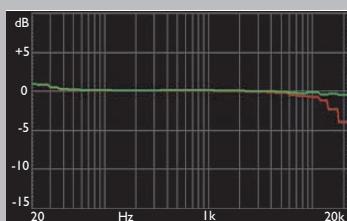
vertical 2.4%

Output (5cm/sec rms) 0.7 / 3.4mV

EL FREQUENCY RESPONSE



EH FREQUENCY RESPONSE



Tech it out!



A classic Technics 1970s amplifier? Actually no – it's a rather clever valve-based phono preamplifier from Audio Detail. Noel Keywood explains all.

Mark" I shouted, "your transistors are burning out!". "There aren't any in there" he replied, "those are valves". I peered harder through the top mesh of his 1978 vintage Technics SU-7100 transistor amplifier and he was right.

This was wrong. The Technics SU-7100 in the Ming-Da/Audio Detail room at the Bristol Audio Show, January 2015, was most definitely a transistor amplifier with top mesh purposed as an air vent to ensure its little trannys stayed cool and didn't do anything detrimental to its health. But looking closely, there weren't any trannys in there anymore. Mark

Manwaring-White, who imports Ming Da but has his own company – Audio Detail – and is an inveterate enthusiast of the thermionic variety, had ripped out the amplifier's innards and installed a valve phono preamplifier instead. What a wonderful idea – I had to review it.

It was fascinating to meet up once again with an old 1970s Japanese amplifier and – in a nutshell – they were crap. But they were clever crap. Everything was cost cut to the bone and, often, a new manufacturing process had been used to reduce cost even further. This little Technics felt lovely to use, its switches were silky and the volume control moved on a detent not even used today. And I think you'll agree its

sharp lines are pleasing on the eye.

But look closely and the sockets are cheap mild steel stampings covered with tarnished tin plate, the loudspeaker output terminals were horrid wobbly things where plastic met metal in gruesome alliance, and the wooden case was a miserable misrepresentation of anything wooden. I'm surprised the switches and pots of this sample worked at all because these were usually the first bits to fail, sending said product to the scrapheap as intended.

Such was 1970s mass production for the consumer market, and it brought back memories for me. But Mark was more sanguine when he eyed up those switches and casework and decided some modification, even

purification, could re-awaken this unit. The Technics has now become an Audio Detail valve phono stage with volume control and phono selector button still performing their original function.

This wasn't just a hollowed out chassis then, but a re-purposed one, some parts remaining to perform their original function. I saw a non-working SU-7100 being sold for £22 on eBay by the way, while searching for more info on this amp.

Inside Mark had worked wonders. There were new mains transformers, one for heaters (d.c.), plus 12AT7 valves for a preamplifier stage accepting line inputs from the rear Tuner sockets.

The phono stage with RIAA equalisation was built around Russian 6N2s (double triodes) Mark recalled (he built this amplifier a few years back). The preamp's output was taken through gold plated phono sockets mounted just above the wobbly old loudspeaker screw terminals.

What worked were the Phono and Tuner buttons, the volume control (100k no less) and the balance control, plus the Tape selector switches. The tone controls were dead.

I plugged in and switched on, using the light lever action mains switch. A little green LED (original) lit above it to show power was being received and, peering through the mesh once again, the valves were aglow. We had amplification. But of



A re-purposed Technics SU-7100 amplifier chassis, with no transistors in sight! Instead, Mark has fitted a two-transformer power supply, a brace of valves and an intriguing three-dimensional arrangement of resistors. Here's a thermionic art form, in a 1970s mass produced amplifier.

indeed it worked with our Ortofon Cadenza Bronze MC cartridge that has quite high output – but hiss was fairly obvious.

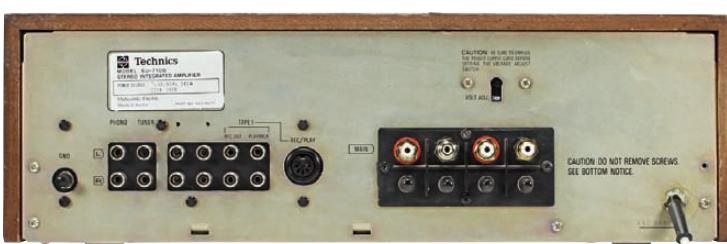
Mark said it was meant for low output MMs or high output MCs such as the Hanna EH in this issue,

LP Aerial, the reggae bass line of King of the Mountain was big and muscular and the dynamic changes were beautifully projected, making the amp sound strong, atmospheric and musical, yet with the gentle demeanour when needed in Pi, reproducing the pulsating organ. I got plenty of dynamic push when spinning a 12in, 45rpm Amy Winehouse single, 'Tears Dry On Their Own'.

Again bass was heavy yet supple; there's no doubt LP should always go through a valve phono stage and Mark's was proof of this – it was fun, big bodied, organic in flavour and spacious.

What a great idea. OK, I have been a bit rude about the SU-7100 but it was little different from other products of the time; don't look too closely at the input sockets used by Leak or Quad on some of their venerated products!

Irrespective of this, it was entertaining to have an old 1970s amp back in the room, in a new role.



A 1970s rear view. Simple and crudely produced socket banks on a cadmium plated, bendy steel chassis. New, gold plated output sockets sit above the old loudspeaker screw terminals.

what specification?

Bear in mind this conversion was a little side project for Mark, rather than a full-on commercial venture like the re-builds on turntables carried out by Inspire or the renovation and upgrades offered by One Thing on early Quad electrostatic loudspeakers.

All the same I measured it and found an MC level of gain at x750 with volume turned right up. And

input impedance being 47k. As a 'proof of concept' build, he didn't spend too much time fine tuning RIAA equalisation and treble was down by up to -3dB at 10kHz, giving a warm balance. But valve phono stages are so sweet, atmospheric and yet dynamic, issues like this seem to matter less than usual.

With our Cadenza Bronze MC, in an SME309 arm on Timestep Evo turntable playing Kate Bush's

CONTACT:

Audio Detail

Mark Manwaring-White

+44 (0)7831 197019

www.mingda.co.uk

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The image features a dark, slightly grainy background with several vinyl records visible. In the upper left, the words 'The VINYL ADVENTURE' are written in a large, white, sans-serif font. A vertical line extends from the top of 'The' down to the end of 'ADVENTURE'. To the right of this text is a graphic of a vinyl record with a red play button icon. Below the main title, the words 'your complete vinyl experience' are written in a smaller, italicized, white serif font. At the bottom, the website 'THEVINYLADVENTURE.COM' is in a large, white, sans-serif font, with a phone number '- 01484 540561 -' in a smaller white font directly underneath it.

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STEVE HACKETT

SPECTRAL MORNINGS 1979



"The title track is a classic piece of symphonic prog that can still bring tears to the eyes"

Time has flown and Steve Hackett's journey has been a long one as 2015 marks forty years from the release of his debut solo record 'Voyage of the Acolyte'. He was the first member of Genesis to release a solo album - before leaving the band in 1977.

Despite the quality of 'Voyage...' and the next album 'Please Don't Touch' (1978) it's the third album in the solo listing, 'Spectral Mornings', that I'd like to focus upon here and it definitely deserves your attention.

"I saw Segovia on stage, eighty-five years old, getting up there and doing it and I thought it if he can do it, when he's that age, that's it. It's a question of getting over the hump, you know, of saying I'm brave enough to do it" said Hackett in 1979 of his thoughts on leaving Genesis and of feeling insecure when he initially left the band.

"When I was with Genesis we had a kind of machine and it became so much of a machine that I almost felt like if they went out on stage and farted it would still draw applause. I'm not saying that the quality diminished to that degree but I just didn't feel that enough risks were being taken both with the content of the songs, the way they were being approached, etc".

Do me a favour and take a quick look at the top of the page, just under the title 'Spectral Mornings' and read that date again.

Think about a title like that, the proggy content and then consider the times. With this album, you could hardly say that Hackett was trying to grab cheap publicity by cloning the current, in vogue music styles of the time, could you?

He said at the time "The only way that I can really function is to work outside fashion and hope that the fashion will come full circle and coincide with my tastes, as it did when I joined Genesis. It was a very unfashionable entity when it was first conceived".

Actually, a lot of old, traditional Genesis fans followed Hackett when he left the band. They'd had enough with the latter's inexorable swing towards commercialisation. Genesis was proving a source of disgust, not joy. To them, Hackett stood on higher moral ground in prog terms.

The album 'Spectral Mornings' improves on 'Please Don't Touch' by providing a better balanced format of pastoral songs and prog instrumentals while being supported by John Shearer, Nick Magnus and former Decameron bassist Dik Cadbury.

Featuring a sparkling sense of humour, the songs are often fronted by Peter Hicks (who, previous to this job, was behind the mixing desk, working on the Hollies LP 'Hollies Sing Hollies', would you believe).

Hackett's guitar work is simply stupendous. In fact, on the original Charisma press release to this album Hackett himself is quoted as saying that, "I believe my playing on this album is my best since Genesis recorded *Selling England By The Pound*".

And I can't argue with that. I also can't argue with Hackett's next quote on the same release, "That was not an instant album to get into either. This has the same richness of quality and a similar spirit." Yep, on the money there too. Hackett also pushes his personal boundaries, tackling the Cantonese koto for the delicate instrumental 'The Red Flower of Tachai Blooms Everywhere'. But the two stand-outs on this album are 'Clocks - The Angel of Mons', a stupendous piece of guitar work and melodic prog., plus the title track which is a classic piece of symphonic prog that can still bring tears to the eyes and send you off on a string-plucked journey, far, far away.

To find this album and plenty more besides, you might want to check out 'Premonitions - The Charisma Recordings 1975-1983' (Virgin), that includes Hackett's first six albums on the Charisma label, together with a wealth of previously unavailable recordings, as well as remixes by Steven Wilson. That's a total of 135 songs on ten CDs and four DVDs (5.1 mixes) plus an extensive booklet; included in this version are 67 previously unreleased recordings between old and new tracks, live and remixes.

You can also find the 'Spectral Mornings' album along with 'Please Don't Touch' re-released separately in a deluxe expanded version with 5.1 mixes by Steven Wilson.

For vinyl fans? Stick with the original issue. I've still got mine and it still provides honourable service. PR



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